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THE

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### Patent Case.—Artificial Teeth.

On the 14th inst. an important patent case relating to the dental art was decided in the United States Circuit Court, this city, Judge Nelson presiding. The suit was brought by G. W. Warren against N. B. Griffin, for infringing the patent of Dr. J. Allen, of Cincinnati, for setting mineral teeth by a compound resembling the natural gum, and forming a continuous gum with the plate. The defence set up was, that the invention was not new, that the specification was vague, and that there was no infringement.

The artificial teeth worn by Aaron Burr were produced in Court as ocular testimony against the novelty of the invention, and, we regret to state, on being handed to one of the jurors he let them fall, and they were broken. The set was constructed in Paris, and had a porcelain gum. The trial occupied five days, and a great number of dentists gave testimony *pro* and *con*. A verdict was given for the defendant.

### Blasting Stumps of Trees.

The London *Mining Journal* states that various successful experiments have been made near London, in blasting stumps of trees with peculiar percussion cartridges, the invention of Capt. Norton.

It is a very easy matter to blast stumps of trees, but in our country we think the process would be far too expensive for farmers, at least on newly cleared timber land. Besides, the removal of the stumps is not the main evil, but their roots. Could our farmers plow close around the stumps on their lands, they would not complain much of the stumps themselves.

### Honolulu Mechanic's Mutual.

We learn that there is a Mechanic's Benevolent Society in Honolulu. It has only 21 members, but it is a good and sound association. They have invested $600, and have $234 in cash in the hands of the Treasurer. There are plenty of benevolent societies in our cities that have ten times the number of members, and not one-tenth of the funds.

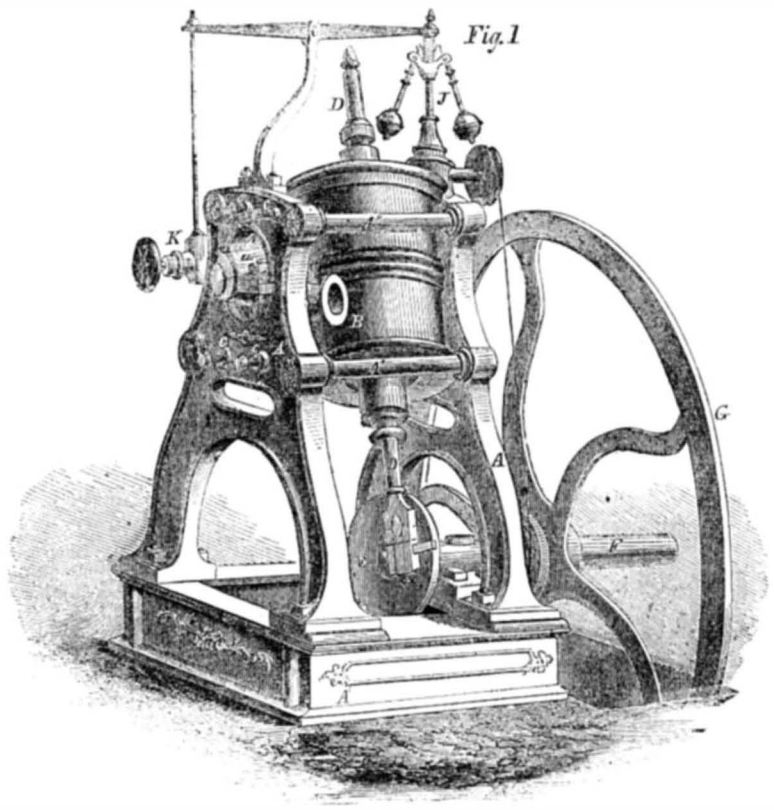
### Nowfoundland Telegraph.

The telegraph line between this city and Newfoundland is completed. It is 1715 miles long, with 85 miles of submarine cable. No difficulty has been experienced in working the instruments through the cable, thus showing it to be perfectly insulated. This line is to connect with the great Atlantic cable, which is expected to be laid down next summer.

### A Bad Place for a Seam.

A locomotive boiler recently exploded at Middleborough, England, causing the death of the engineering draftsman and three laboring men, who were in the yard where the engine was standing, while steam was getting up. It came out in the evidence before the Coroner's Jury, that this boiler was constructed with a seam of plates running along its top, and to this faulty construction the accident has been attributed. There should have been a solid plate along the top instead of a seam with a row of rivets. This was the opinion expressed by engineers who gave their testimony as witnesses.

## IMPROVED OSCILLATING STEAM ENGINE.

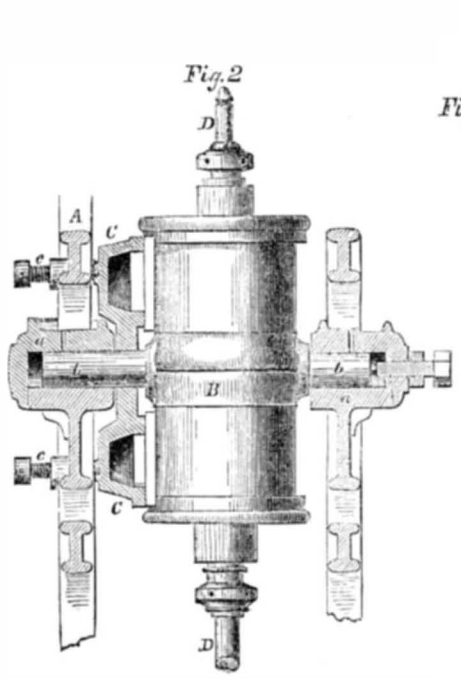


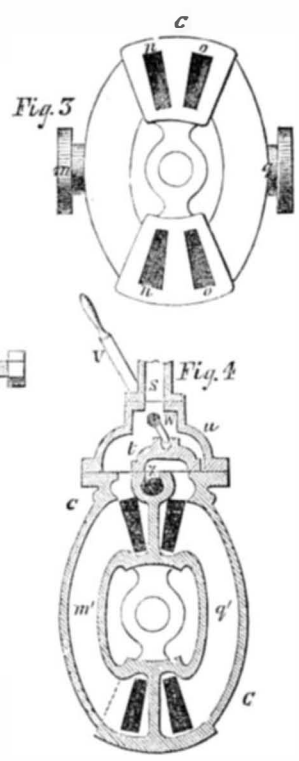

Improved Oscillating Steam Engine.

The accompanying figures illustrate an oscillating Steam Engine, for which Letters Patent were granted to Messrs. Cridge & Wadsworth, of Pittsburg, Pa., December 12th, 1854, but never before thus made public. Since that time these engines have been thoroughly tested, and have exhibited such advantages that they have come now into very extensive use in Pittsburg and vicinity as well as in more remote places. This engine belongs to that class of oscillating engines which are commonly called "side pipe" engines—the side pipe being the valve by which the steam is distributed in the cylider.

Fig. 1 is a perspective view of the engine; fig. 2 a side view of the cylinder, with a section of the side pipe and frame-work; fig. 3 is a face view of the side pipe; fig. 4 a section of the side pipe, with a reverse valve attached. Similar letters indicate like parts.

A A A′ A″ are parts which constitute the frame of the engine, B is the cylinder, whose trunnions, *b b*, rest in the boxes, *a a*, of the frame; C is the side pipe or valve; *c c* are four adjusting screws, by which the side pipe is kept up steam tight to the valve seat surfaces of the cylinder. There is a counter set screw, bearing against the opposite trunnion of the cylinder, and resisting or counteracting the reacting power of steam against the cylinder at the valve seats. D is the piston rod, passing through both cylinder heads, which affords the advantage of an equal amount of steam pressure on both sides of the piston, and gives leverage to the piston rod, to set the cylinder into oscillating motion. E is the crank disk, connected by a strap joint with the piston rod, D. F is the fly-wheel shaft, and G the fly-wheel. J is the governor, K the throttle valve.




The side pipe, as shown in fig. 3, is adapted for such engines as are not reversible. The steam enters at *m*, and is admitted into the cylinder by the openings, *n n*, alternately at the top and bottom, by the oscillations of the cylinder, (the side pipes being stationary) and it is exhausted through the openings, *o o*, and the pipe, *q*. If the engine is desired to be reversible a valve, *t*, is used, as shown in fig. 4, which is enclosed in a steam chest, *u*, and which is set by means of a lever, V, and tooth, W, in such a position that the admission steam, (which enters the chest at S,) enters either into the side, *m′*, of the side pipe, the side, *q*, being then the exhaust side, or into the side *q′*, when the side *m′* will be the exhaust side. In both cases the escape steam passes through the cavity of the valve, *t*, and exhausts through the opening, X. By thus changing the receiving or escape sides of the side pipe at pleasure, the engine shaft will revolve in one or the other direction.

The main feature in this engine is the adjustable side pipe. In all the other side pipe engines the valves are always kept up to their seat and adjusted by means of a nut or screw in the center of the trunnion, but as the reacting pressure of the steam at the valve seats against the side pipe is changeable (which is caused by the steam communicating at one time with the cylinder, at another time being cut off, alternately at top and bottom) there is always a tendency of tilting in the side pipe which the adjusting screw in the center does not effectually counteract, hence the unequal wear of the side pipe and the difficulty of keeping it in good order.

In the above described engine, however, the re-acting pressure of the steam against the side pipe is counteracted directly, the adjusting screws being opposite the steam openings in the valve faces of the side pipe; this prevents any tendency of the side pipe to tilt or spring from the pressure of the steam, and keeps it up to the seat uniformly, no matter how much the re-acting power of the steam may change; in consequence of this the valve will have a uniform wear, and will, therefore, be always in excellent order. The application of the four set screws allow the valve to be adjusted at any place where it is wanted; the screws are set so that they just counteract the steam pressure, and keep the surfaces steam tight, and strained no more; the friction of the valve is hereby far less than in the side pipe, adjusted at the center, where it is necessary to strain the screw very hard to keep the valve faces steam tight, or in the ordinary slide valve engines, where the full pressure of the steam lays on the valves.

The whole construction of the described engine is elegant, compact, light, durable, and extremely simple. It is easy to build, as almost all the work on it can be done on the lathe.

Since the manufacture of these engines was commenced (about two years ago,) we understand that they have become great favorites where they are known, and have taken the precedence of others of the same class, because they obviate the evils with which the others are justly charged.

The patentees, whose advertisement will be found in another column, have met with merited success in their business since they commenced to construct them. More information may be obtained by letter or otherwise, addressed to them at Pittsburg, Pa.

### The Exploring Bark Resolute.

The British bark *Resolute*, forming part of the Arctic Expedition in search of Sir John Franklin, was abandoned in the ice but was afterwards found by a New Bedford whaling vessel and brought home. It was purchased by our government, repaired at the Brooklyn Navy Yard, and sailed on the 13th inst. for Southampton, Eng., to be presented to the British government—a present from Uncle Sam to Uncle John—a very touching and appropriate gift indeed.

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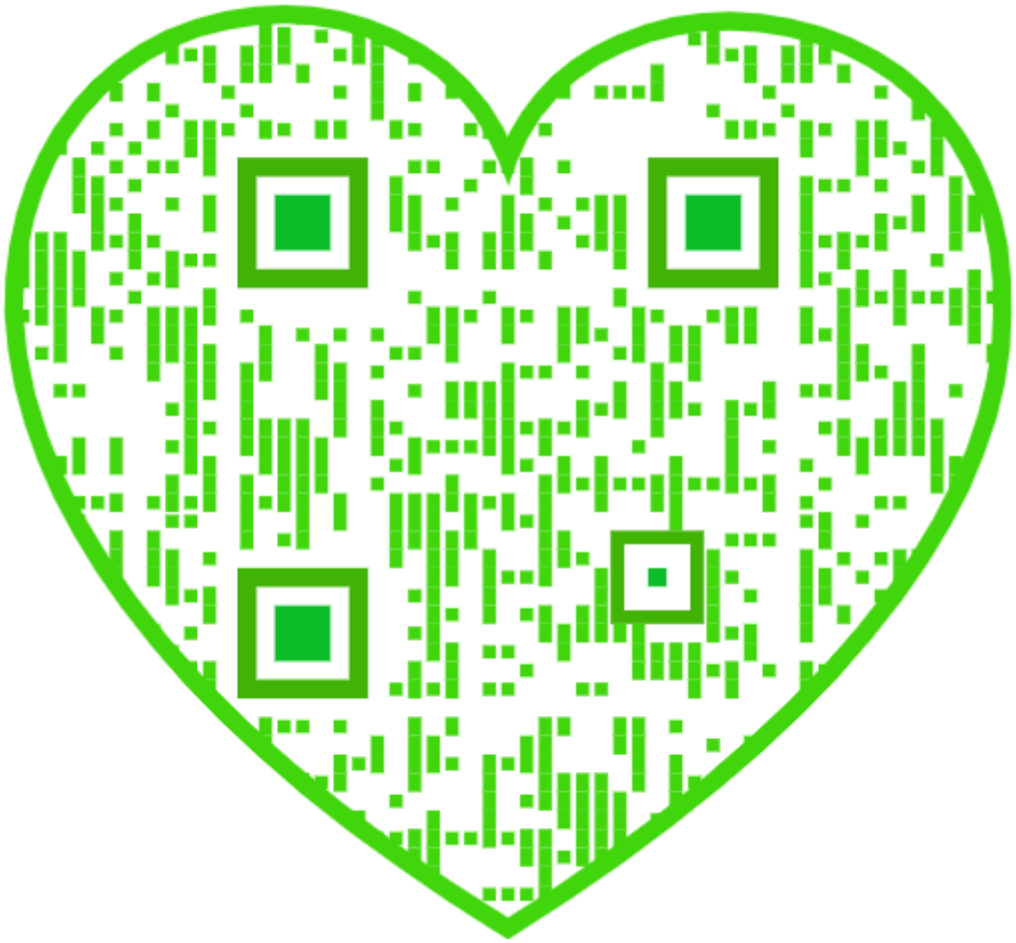

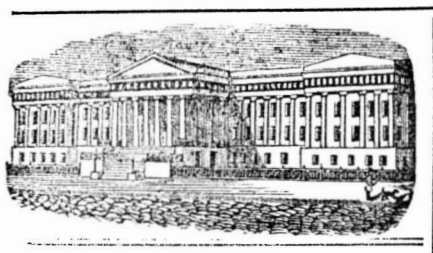

### Advice to American Patentees Concerning Foreign Patents.

It is generally much better to apply for foreign patents simultaneously with the application here. If this cannot be conveniently done, as little time as possible should be lost after the patent is issued, as the laws in some foreign countries allow patents to any one who first makes the application, and in this way many inventors are deprived of their right to take patents for their own inventions.

Many valuable inventions are yearly introduced into Europe from the United States,—by parties ever on the alert to pick up whatever they can lay their hands upon which may seem useful.

It is a part of our business to secure European patents —in fact three-fourths, and probably more, of all the patents granted in Europe to American citizens, are solicited through this office. We have faithful agents in the chief cities in Great Britain and on the Continent, and through them we can not only solicit patents, but often effect their sale upon advantageous terms. We can give the names of many of our patrons who have realized fortunes out of their European patents through our Agents abroad, if it is desired

We are prepared at all times to furnish advice in regard to Foreign Patents, and will cheerfully do so on application personally at our office or by letter.

Models are not required in any European country, but the utmost care and experience is necessary in the preparation of the case.

Almost every invention that is of value in this country is of equal value abroad, and we would recommend patentees to pay more attention to securing their inventions in foreign countries than they have heretofore done.

All particulars in regard to the modus operandi of obtaining patents in any country where patent laws exist, may be had by addressing the publishers of this paper.

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[Reported Officially for the Scientific American.]

## LIST OF PATENT CLAIMS

### (ssued from the United States Patent Office

FOR THE WEEK ENDING NOVEMBER 18, 1856

BUMPER BRAKES FOR R. R. CARS—Francis Armstrong, of New Orleans, La.: I claim the employment of the yielding force, made by the pull on the cars, to adjust the apparatus, and place it in position, that the force acting by the cars coming in contact with each other, will secure that force to act on the brakes, and close them on the wheels, and the force made by the pull on the cars when allowed to re-act, reversing the position of the apparatus in the placing it, so that the pressure of the cars acting against each other, can operate on the apparatus, and have no action on the brakes. This is claimed whether done by the described apparatus, or any other analogous mode producing the same effect.

ANTI-FROST FAUCET—F. H. Bartholomew, of New York City: I claim the application of a waste way to draw cocks, arranged and operating substantially as and for the purpose described.

STEAM DRAG—George Bradley, of Paterson, N. J.: I claim, first, the arranging of the driving wheels of a steam carriage in a truck frame that can turn independent of the engine frame, and so that the engine frame shall follow or be drawn by the truck frame, instead of the latter being controlled by the former, as has heretofore been done.

I also claim transmitting the power of the engine to the driving wheels in the truck frame, so arranged through the swiveling point or axis of the truck frame, so that there shall be no cramping or twisting of the frames or connecting rods, substantially as set forth.

STEERING APPARATUS FOR SHIPS—Thomas Carr, of Liverpool, Eng.: I do not confine myself to the details, as I have shown that they may be variously modified and yet retain the peculiar characteristics of my invention.

I claim the application to the ordinary steering apparatus of vessels, of a crank or its mechanical equivalent, the eccentric working in combination with an entire pulley or its segment, a quadrant on a vertical axis, the whole being interposed as a medium of communication between the wheel, ropes, or chains, and the tiller.

DRAINING MACHINES—John Cole & A. L. O. Wall, of De Witt, Ill.: We claim, first, the combination of the brace coulter, E, and rotating coulter, F, with the mole, substantially as set forth.

Second, constructing the mole in sections flexibly connected together.

Third, constructing the mole with a finor knife on its sole, to make a deep furrow in the bottom of the drain to facilitate the entrance of the water from the adjacent soil.

FASTENING DOOR KNOB SPINDLES—Almon Cooley, of Hartford, Conn., assignor to Roderick Terry & A. Cooley. I claim the conical slide, C, when combined with the spindle, S, and knob, K, and constructed in the manner described for the purposes specified.

DOOR FASTENERS—Legrand Crofoot, of Syracuse, N. Y.: I claim combining the two plates, A and B, constructed in the manner described, with the spring bolt of the plate, A, and the eye hook, of the plate B.

DIAPHRAGM FLUID METER—J. Henry Darlington and Wm. Piper, of New York City: We do not claim any of the separate elements or devices; nor do we claim any special combination thereof.

But we claim their particular arrangements, as before, and for the purpose set forth.

SUGAR DRAINING APPARATUS—Gustavus Fincken, of Brooklyn, N. Y.; I claim the employment for the reception of the molds of a wheel carriage composed of a box or vessel, A, with seats, d d, to receive the molds and a frame, D, to keep them upright, and with stoppers, h h, so applied within the box or vessel as to enable several to be inserted in or withdrawn from their respective molds simultaneously by a crank or its equivalent, at one end or side of the carriage, as described.

[By this sugar mold carriage the common severe and tedious labor of carrying the sugar to the molds in ladles is dispensed with; and when the sugar has stood a sufficient length of time in the molds, the stoppers are all removed at once by simply turning cranks on the box of the carriage, by which act the draining of the sugar commences instantaneously. The improvement is an excellent one in fine sugar making, saving a great amount of labor; and thus reducing the expense of its manufacture.]

WASTE VALVE FOR HYDRANTS—Robert Lawson, of St. Louis, Mo.: I claim the interior arrangement and combination of water valve and air chamber, as shown and described.

I do not claim the application of an air chamber, to the receiving pipe.

But I claim its peculiar combination with the waste valve, as set forth.

SLEEVE FASTENER—J. P. Derby, of Cavendish, Vt.: I claim arranging and combining with a face plate by means of a post or stem, or cross bar or plate, which, with proper construction, admits of the insertion of a stem or stems into the holes of a wristband or cuff, and is then secured in place by means of slots in the plate that revolves until the stems are entered therein.

I also claim the spring which serves to keep said stems in place in the slots, and which prevents the face plate from being turned until its force is overcome.

I also claim combining with the stem of face plate, and the cross bar, in manner substantially as described, two sets of cams, whereby the distance between the stems of cross bar and face plate can be graduated to receive the wristband at pleasure, and whereby the distance that the face plate and cross bar traverse in opposite directions, may also be controlled, the whole making a perfect and safe fastener for the purpose described.

HARVESTING GRAIN—Geo. F. Foote, of Buffalo, N.Y.: I claim the peculiar constructed scroll cylinder, A2, in combination with the cylinder case, F, and the gathering wheels, M M, when the same are constructed and arranged to operate in relation to erch other and the main frame, A, in the manner and for the purpose set forth.

SPRING HOLDER FOR SLAT BLINDS—W. L. Gallaudet, of New York City: I claim the combination of the peculiarly shaped spring described, with the rod and with the lower rail, substantially in the manner set forth.

GAUGES FOR STEAM BOILERS—J. C. Harris, of Savannah, Ga.: I claim the arrangement of the float chambers, the stock-cocks, and the blow-off cocks to adapt the gauge to the employment of oil, interposed between the float and the water to carry the float, substantially as set forth.

REGULATING THE DRAFT OF HOUSE FURNACES—S. L. Hay, of Reading, Mass., and H, B. Osgood, of Dorchester, Mass: We claim the compound valve, A, with the spring, d, or its equivalent and equipoise, K, in combination with the pipe, C, substantially as described and for the purposes of a compound self-acting regulator, as set forth.

CANDLE MOLD—August Hengstenberg, of Muscatine, Iowa: I claim the combination of the spools, as constructed in my machine with their gearing, and locking; also the securing of the cutter by means of the layer, S, substantially as described and for the purposes specified.

CUTTING APPARATUS OF GRAIN AND GRASS HARVESTERS: M. G. Hubbard, of Penn Yan, N. Y.; I claim the combination of a single cutter with a double cutter, when both are constructed substantially in the manner described, and made to reciprocate in directions opposite to each other, substantially in the manner and for the purposes described.

FORKS FOR HANDLING HEATED PLATES—G. W. Hyatt, of Auburn, N. Y.; Disclaiming all other forms or modes of constructing forks, I claim the clamp or spring, F, for the purpose of supporting the tines, and also to allow them to be adjusted to suit articles of different diameters.

VENTILATING SHIPS—Rudolph Knecht, of New York City: I do not claim wings to draw in fresh air or to expel the foul air out of a room.

Nor do I claim the ventilating tubes.

I claim the combination and arrangement of two sets of wings on one shaft acting simultaneous, so that while one is expelling the foul air the other will draw in fresh air, in the manner substantially as described and for the purpose specified.

WAGONS—Henry Kruse, of New Orleans, La.; I claim the application to wagons of wheels made buoyant by the use of disks, that will cause the wagon to be supported in water from such buoyancy, with the application of propelling blades on said wheels to cause the wheels to be available in propelling the wagon in water, and the same wheels, by removing the propelling blades, can change the wheels so that they are available in their uses in the transporting of substances on land similar to common wheels of wagons.

RECIPROCATING SAWS—G. D. Lund, of Yonkers, N. Y.: I claim placing or fitting the rod or shaft, C, to which the lower strap or socket, D, is attached loosely in the slides, B B, substantially as described for the purpose specified.

[This is a good improvement. The rod to which the pitman is attached is fitted in slides, so that it can turn in them; the socket in which the lower end of the saw is secured, is attached to the rod so that the saw may be more or less inclined or adjusted, and the necessary *rake* given to it without causing any additional friction upon the lower slides.]

PREPARING RATTAN FOR UMBRELLAS—J. W. Martin, of Philadelphia, Pa.: I claim the combined devices, as described, for forming and tipping the rattans or whalebone for umbrella ribs, as set forth.

CUTTING FILES—Chas. Miller, of New York City: I do not claim the mere employment of a stop to regulate the depth of cut of the chisel.

But I claim fitting the chisel to work in a stock which rests upon the file blank itself, or on a pattern of similar form moving with it throughout the whole length of the movement of the blank under the chisel, and serves as a stop to the chisel, substantially as and for the purposes described.

[Quite a number of machines for cutting files have been invented, but it has been very difficult to give that uniformlty of cut to the file, which is given by hand labor. This invention consists in a certain contrivance which regulates the operation of the cutting chisel to produce a uniform depth of cut from end to end of the file. A result difficult to accomplish has been obtained by this improvement, and it is a very useful one, because, upon the uniform cut of a file its character in a great measure depends.]

CLOTHES DRIERS—Saml. Morrill, of Andover, N. H. I claim arranging the ratchet on the side of the reel, in combination with the pawl, H, and lever C, in such a manner that the pawl and ratchet are brought into play when the reel is tilted; but thrown out of play when in its horizontal position, substantially as described and for the purpose set forth.

[The reel to which the clothes are secured on this drying machine, is attached to an upright post, in such a manner that it (the reel) may be tilted or inclined for the purpose of putting on the clothes to dry, and taking them off the reel when dry. The improvement renders the clothes-drier more convenient to use.]

MEDICAL RESPIRATOR—E. M. Murphy, of Lexington, Ill.: I claim the combination with the usual medical inhaler of a fan, A, to be revolved by the act of inhalation, in the manner and for the purposes substantially as specified.

SLICING APPLES—E. L. Pratt, of Philadelphia, Pa.: I claim attaching the knives to a reciprocating piece, P, by means of pins or axes on which they can so rotate in combination with the straight rod or guide, O, for the purpose of causing the knives to descend through the apple, in lines parallel to its axis, as set forth.

WEATHER STRIPS FOR DOORS—Reuben Wight, of Westfield, N. Y.: I claim the adjustable weather strip A, operated by the segment lever, E, in connection with the movable button, G, and the cams, J J, the whole constructed and arranged in the manner and for the purpose fully set forth.

HEATING FEED WATER OF LOCOMOTIVE ENGINES—John R. Sees, of New York City: I do not claim heating the feed water of a steam boiler in its passage from the feed pump to the boiler; nor heating it by the waste or escape heat from the boiler; nor placing the heating pipes in the smoke box of the boiler, as they are known and used; neither do I claim the use of the circulating pipe and double-acting check valve: nor placing the heating pipes and their connections below the water line of the boiler, as secured to me by letters patent dated August 5th, 1856.

But I claim the construction of the duplicate cylindrical coils, G and I, and their arrangement in relation to the smoke box, A, the exhaust pipes, K K, the tubes, C, and the base, N, of the smoke stack of a locomotive boiler, as and for the purposes set forth.

CLEANING INDIA RUBBER—T. Sault, of Seymour, Ct. I claim the cleaning of india rubber by means of the serrated sided bars, D D, constructed and arranged to operate in combination with each other, substantially as described.

[The pulp engine for grinding rags into pulp for paper, with but little or no modification, has been heretofore used in cleaning india rubber. This improvement consists in providing the cylinder of the pulp engine with peculiar serrated-sided teeth to work between stationary serrated-sided bars on the concaved bed below the cylinder, for the purpose of tearing up the rubber by a peculiar rubbing and stretching action which is more effective in extracting the impurities than the action of the cutters and teeth heretofore employed. Pieces of wood and bark come mixed with india rubber, these have all to be removed, and this has been very difficult to accomplish by the common machinery. This improvement removes these impurities very effectually.]

BREECH LOADING GUNS—Christian Sharps, of Philadelphia, Pa.: I am aware that the breech of a fire arm has heretofore been closed by a plug-breech-pin, connected therewith by a bayonet attachment, and that beveled ro spoon-formed piercers have been used to pierce cartridges.

I am also aware that a bush has been used in that part of the breech which is liable to burn by continued use, I therefore lay no claim to the invention of such devices of themselves.

But I claim the combination and arrangement of a spoon formed cartridge piercer with the turning breech pin of a breech loading fire arm, whereby the powder is more effectually worked into the channel leading to the primer by the operation of locking the breech pin in its place.

I also claim the combination of a removable bush and elastic packing ring with the breech of a fire arm, substantially as set forth.

WASHING MACHINES—Ira Reynolds, of Republic, O.: I claim the arrangement and combination in washing machines of the reciprocating pulleys, i, springs, p, and plungers, b, constructed and operating substantially in the manner set forth.

BREECH-LOADING FIRE-ARMS—Gustave Scharffe, of New York City: I claim, first, the manner of cocking the hammer by the opening of the breech, substantially as described.

Second, I claim the arrangement and construction of the hammer, operated in the manner specified.

Third, I claim securing the breech cap, E, either upon or into the gun barrel, said breech cap being provided with a hole corresponding with a hole in the gun barrel, by the unscrewing of which breech cap, the hammer is cocked, and both holes are brought above each other, so as to admit the cartridge, while, by the screwing up of said breech cap, the hole in the gun barrel is closed up again, substantially as described.

GAS REGULATOR—W. G. Sterling, of Bridgeport, Ct.: I am aware that two chambers connected at the bottom have been used by means of a float in one chamber attached to a valve as a regulator; and while mercury has been found too heavy, other fluids, by their evaporation, constantly derange the operation of the machine, but by means of the vibrating balance in both chambers, my apparatus is extremely sensitive to the slightest pressure, and not subject to this difficulty.

I claim the vibrating balance, D, with the partition, B, forming two chambers and extending into said balance, D, which is so adjusted that it vibrates in the two chambers, and is connected with a valve in any suitable form, as described, or any other mode equivalent thereto.

MILL STONE DRESS—T. B. Stout, of Keyport, N. J.: I do not claim making the furrows of different depths, nor simply terminating deep furrows with shallower ones at the periphery, as I am aware that the equivalents of such have before been used.

I claim the combined arrangement of furrows upon the grinding plates; viz., the inner furrows, d d, having their abrupt edges on the two grinders meeting by the revolution of the runner deep at the central ends, but running out to the surface at the outer ends, while the peripheral furrows are arranged oblique to the inner furrows, their edges inclined in the opposite direction, and having a considerable proportion of plane surface between them, substantially in the manner and for the purposes described.

CUTTING VEGETABLES—Jacob Geiss and Jacob Brosius, of Belleville, Ill.: We claim the cone C, provided with slots, d d, and secured upon the shaft, B, as shown, in combination with the knives, g, attached to the arms, e e, and disk, f, arranged as shown and described, for the purpose specified, it being understood that I do not claim the use of a hollow revolving cone armed with knives for slicing vegetables, as that is not new; but only the mode of construction specified for effecting the adjustment for the thickness of the slices.

[This vegetable cutter has a rotating transverse hollow slotted cone on it, with a cutting shaft capable of adjustment, to cut fine and coarse. A hopper is placed over the hollow cone, and the vegetables fed down an incline plate, and cut into slices, which pass through slots into the hollow cone, and from it out at its larger end. This machine is very simple and well adapted for cutting various kinds of vegetables, potatoes, &c., for animals or for culinary purposes. It is also admirably adapted for cutting apples for cider mills; and by simply putting pressure rollers under the cone to express the sliced apples, it is rendered into an effective complete cider mill.]

GAS RETORT FASTENING—W. H. St. John, of New York City, I am aware that lead has been used for tightening the joints of boilers; this I do not claim.

But, first, the tightening with copper of the joints of doors of gas retort heads, when the said joint is effected by the otherwise usual groove inserted in the flange of the mouth piece, to meet a corresponding projection on the door in the manner and for the purposes specified.

I further claim the placing a hot air chamber beneath the mouth piece to consume the tar and oil collecting on the bottom of the latter.

PARING APPLES, POTATOES, &C.—E.L. Pratt, of Philadelphia. Pa., assignor to Leonard Harrington, of Worcester, Mass.: I claim, first, moving the apple, potato, or other object, in a direct line past the knife, or the knife past the object, during the revolution of said apple, potato, or other object, by means of the screw shaft and cogged rack or other device substantially the same, whereby the operation of paring is performed by the turning of the screw shaft without any other movement of the knife than that occasioned by the curvature, size, and inequality of the surface or form of the article being pared, to which the said knife is accommodated by the action of the spring, as fully set forth.

Second, I claim the peculiar form of the knife, that is to say, shaping the portion nearest the shaft of the form of a segment of a circle of a given radius, and the remaining portion furthest from the shaft, of such curvature as will form a segment of a cycloid of a circle combined with the first portion, and correspond or nearly so, with the spiral curve of the screw, when the end of the apple, potato, or other object, is being pared, in such a manner as to enable its edge to assume at all points of contact with the potato, or other object, a convex curve the reverse of the convex part of said apple, potato, or other object with which it is in contact, and thereby enable its end, and every inequality of its surface to be pared by thus accommodating the edge of the knife to these parts, substantially as set forth.

MANUFACTURE OF IRON AND STEEL—Henry Bessemer, of London, Eng, Patented in England Feb. 12, 1856: I do not confine myself to the precise details specified, provided that the peculiar character of my invention be retained.

I do not claim injecting streams of air or steam into molten iron, for the purpose of refining iron, that being a process known and used before.

I claim the conversion of molten crude iron or of remelted pig, or finery iron into steel or into malleable iron, without the use of fuel for reheating or continuing to heat the crude molten metal, such conversion being effected by forcing into and among the particles of a mass of molten iron currents of air or gaseous matter containing or capable of evolving sufficient oxygen to keep up the combustion of the carbon contained in the iron till the conversion is accomplished.

HARVESTERS—Alvin Bullock, of Busti, N. Y.: I claim operating the sickle bar, H, by means of the right angle lever, G, on the shaft, E, in combination with the lever, T, bar c, and flanch D, when the same are constructed and arranged to operate in relation to the main frame, A, drive wheel B, and adjustable finger bar, I, in the manner and for the purpose set forth.

[A zig-zag projecting flanch is attached to the outside of the driving wheel; the flanch, as the machine is drawn along, operates (through two levers) the cutter bar, and gives it a reciprocating motion. The method of thus operating the sickle bar without gearing is very simple, causing little friction in working, and operating smoothly on rough aud level ground.]

PROJECTILE FOR FIRE ARMS—William Taggart, of Haverhill, Mass.: I do not claim the central aperture, nor communicating a revolving motion to the ball, by spiral ridges, or projections on the inner surface around such an aperture.

But I claim the spiral partition, C, arranged and operating substantially as specified.

I also claim the wings, a a, arranged in the manner and for the purpose described.

EXCAVATORS—John F. Willey, of Fredonia, N. Y., assignor to B. Merrill and Thos. Phillips, of Cassadaga, N. Y., and John F. Willey, I claim forming the scoop of two parts, D E, connected by joints or links, d d, the bottom of the scoop being formed of slots, a, which are allowed to turn the scoop being suspended to the cart, and the whole arranged as shown and described for the purpose specified.

[This improvement relates to road excavators; the scoop is formed of two parts connected by a joint, and the bottom of the two formed of slats which are allowed to turn. The scoop is suspended by chains to a cart, so that it may be raised bodily. As the cart moves along, the scoop may be readily filled and as easily discharged. As the scoop is formed of two parts jointed together, each part is filled separately, therefore there is not such a large quantity of earth to be forced backward, at once, while filling the scoop. The power required to work common excavators is great, because of the great amount of earth to be forced back in the scoop. This improvement remedies this evil.]

DESIGN.

PARLOR STOVES—Elisha Smith, of Albany, N. Y.

[Now that the Presidential Election is over, we expect to see the weekly list of claims gradually augmenting in numbers. In the above list we recognize about *one-third* of the cases as having been prepared at this office.—ED.

### Complimentary.

The editor of the *Ladies Companion*, published in Boston, thus speaks of the SCIENTIFIC AMERICAN:—

"We have had the pleasure of perusing this invaluable paper for the last five years, and we candidly confess that we do not know of another paper in the world for which we should be willing to exchange. It presents a complete record of all the various improvements in the means of human civilization, but is more especially devoted to scientific and mechanical progress. No person should fail to take this paper who wishes to keep posted-up in such matters. Its editors are men of sense and ability, who are not afraid to express an opinion when based on science, though it may be in opposition to the popular notions of the day. We have never read a paper from which we get so much 'value received' for so low a price."

### Candle Wicks.

The wicks of tallow candles that require no snuffing, are made in a peculiar manner. One thread of the wick is first impregnated with subnitrate of bismuth ground up in oil, and the strand is bound round with this thread spirally. The several strands—one, two, or three—are then spirally wound round a very thin wire, which is placed in the center of the mold, and the tallow is poured in; when cold the rod is withdrawn. On burning such candle, the wicks uncurl and form so many separate flames, while their ends, coming into contact with the air at the edge of the flame, are consumed. Any plan, however, by which the wicks can be made to uncurl during combustion, will obviate the necessity of using snuffers: such wicks, however, are liable to make candles gutter, or, to use a common expression, "run."

### Enduring Cold.

It is wonderful how much cold a man can be inured to withstand. In Dr. Kane's Journal it is stated that one of his party, George Riley, who was of a robust constitution and cheerful temper, could sleep in the open air on a sledge, with the thermometer at 30°, without experiencing any ill effects from the cold.

### A Sugar Cane Expedition.

The U. S. storeship *Release*, one of the vessels of the Hartstein Expedition in pursuit of Dr. Kane, has been selected by the government for the purpose of visiting the shores of the South Atlantic, to procure cane and seeds, under the appropriation of $75,000, which was made for that object at the last session of Congress. It is expected that she will visit the shores of Central and South America, as well as many of the Weet India Islands, and return early next spring.

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### An Atmospheric Telegraph.—Speed of Air in Tubes.

MESSRS. EDITORS—A circular has been sent to me, from which it appears that an effort is being made to form a company for the purpose of constructing an atmospheric telegraph from Boston to New York. In this circular an extract is given from the SCIENTIFIC AMERICAN, of which the following was the concluding paragraph :—

"Suppose a line of two feet tube laid from Boston to New York, it would contain about 4,000,000 cubic feet of air. Suppose twenty pumps of ten feet diameter and ten feet stroke are located at the Boston end, connected with the cylinder; these twenty pumps contain about 15,714 1-7 cubic feet. Suppose the pumps are worked twenty strokes in a minute, we have removed 314,285 2-7 cubic feet of air. Suppose the plunger was let in at New York at the commencement of operating the pumps, and the pumps continued to run for fifteen minutes, in which same rate 4,714,-279 2-7 feet of air would be removed, and the cylinder only containing 4,000,000, the plunger must reach Boston about as soon as this work could be performed, so far as we can see, and the same result the other way."

In respect to the *time* required to pump the air out of a pipe of the length, and under the circumstances named, the laws of nature have fixed a limit below which it cannot be reduced, whatever be the number, capacity, and speed of the pumps, for the pumps can remove air no faster than it is capable of flowing towards them, by virtue of its own inherent elastic force.

The laws which govern the flow of air by virtue of its own elastic force are given in the *American Journal of Sciences*, second series, Vol. 5, page 78, Vol. 9, page 344, Vol. 12, page 186.

Applying the principles which are developed in the articles referred to, to the case in hand, we shall arrive at the following conclusions :—

1. If the number, capacity, and speed of the pumps be such as to maintain a semi-vacuum beneath the pistons, (a vacuum say of 7 1-2 lbs. to the square inch,) the air will flow in the pipe towards the pumps under half its natural density, and with a velocity of about 650 feet per second.

2. If the number of pumps be increased so as to maintain a greater vacuum beneath the pistons than 7 1-2 lbs. to the inch, the flow of air towards the pumps will not thereby be increased.

3. After the pumps are put in motion 30 minutes must elapse before the effect will be felt at the other end of the pipe.

4. Supposing the plunger to move without friction or other resistance, and the air to flow in behind it without obstruction, 30 minutes more will be required to bring it to its destination.

5. Eight pumps of the capacity and speed named will be sufficient to maintain a semi-vacuum beneath the pistons, to drive which will require the power of 4,000 horses.—Twenty pumps will accomplish the work in no shorter time, and will require the power of 12,000 horses.

* * *

New Haven, Conn., Nov. 8th, 1856.

[The foregoing article is from the author of the articles referred to in the *Journal of Science.*

### Rice Thrashing Machines.

MESSRS. EDITORS.—At a time when we have machines invented for most every purpose, and that too of a cheap and economical kind, it is strange that our inventors cannot find a cheap and economical method of thrashing rice, The rice grain, when properly harvested, holds on with considerable tenacity, and therefore is hard to quit the straw; this would be the principal difficulty to be overcome. Great care would also have to be taken not to break or fracture the grain, as in this particular the value of the article in market in a great measure depends. It is true we have rice thrashers and steam engines to drive them, but the cost is so great that none but large planters can afford to get them. These machines cost thousands of dollars, whereas the small planter wants a machine that will do his work and only cost its hundreds. I have no hesitation in saying, that if such a thrasher and engine could be got up, they would meet with such a ready sale as would amply remunerate the inventor. A. S.

Georgia, November, 1856.

### Buying Machinery.—A Hard Case.

MESSRS. EDITORS—I address you for the purpose of gaining information in relation to a difficulty with parties in this city about machinery purchased one year ago.

I purchased three machines of a manufacturing company, with the understanding that they were not and could not be patented after using them several months. I have been called on by a representative of another company, and forbid to use the machines, as they were an infringement of their patent. The party of whom I purchased refuse to take back the machines.—Both companies continue to make the machines—one stamping them "patented," and the other does not. What redress have I, and what is the proper course to take? By answering in your next number you will much oblige S. T. MCDOUGALL,

333 Broadway.

New York, Nov. 10, 1856.

[This is a hard case, and, we regret to say, not a singular one by any means. Numbers who have purchased machines honestly, without any intent to infringe a patentee's right, have been subjected to threats of law suits, or the payment of the patent fees exacted. In the case before us it does not speak well for the company that has threatened our correspondent, nor the one that sold him the machines upon the understanding which he mentions. However, we are afraid that there is no remedy for him in the premises, if his machines really do infringe a patent.

A patentee (or his assignee) has a right to prevent the *making*, *using*, and *selling* of any machine which infringes his patent. The company that has threatened him should in equity sue the parties that make the machines mentioned, as more evil is done by them than by those who buy and use them, their conduct involves innocent persons, like our correspondent.

Unless a machine or article has been in use with the consent of the inventor for more than two years prior to his application for a patent, it does not become public property. An inventor, when he receives his patent, can stop the constructing, selling, and using of any machine that infringes his patent, even if it were in use for twenty-three months before his application. If our correspondent had inquired of us before purchasing the machines, he would have been informed that the use of his machines for *several months* did not render them public property, unless they had been in public use for over two years previous to the application for the patent. If he can prove by witnesses or by good documentary evidence that the company from whom he purchased those machines gave him assurance that they were not, and could not be patented, then he has his remedy at common law. This is his only remedy; if he has not this security we advise him to settle with the patentees of the machines, and look out in future for such traps.

### Dark Days.

MESSRS. EDITORS—On page 59, present volume, SCIENTIFIC AMERICAN, there is an article under the head of "Dark Days," which is evidently designed as a description of Indian Summer. Your correspondent says that the great distinguishing feature of the season was that the atmosphere was filled with smoke, and that he should like to know where it comes from.

Now I propose to inform him of facts within my knowledge. The past summer has been remarkably dry, and since harvest a fire has been running over the counties of Ingham, Eaton, Clinton, and others north and west, destroying a large amount of hay on the marshes, and burning deep into the muck, also in swamp lands, burning the soil, and making a clean sweep of much valuable timber. I venture the assertion that more smoke arose from the above-named counties in one day than half the cities in the Union would make in a week; and when the wind blew from the north, we would be enveloped in smoke, as in a thick cloud, rendering large objects invisible at the distance of a few feet. Would it not be reasonable to suppose (the wind being from the north) that the smoke at Dayton proceeded from the places above-named. When the wind came from the south, south-east, or south-west, we were comparatively free from smoke, and the sun shone out, giving the peculiar tint of an ordinary Indian Summer. If the same changes of wind produced the same results at Dayton as were noticed here, the evidence, I think, is conclusive that the great smoky laboratory was a few miles north and west of this place. H.

Parma, Mich., Nov. 4th, 1856.

### The American Institute Fair.—How Conducted.

MESSRS. EDITORS—In your notice of the close of the Fair of the American Institute you give the Managers too much credit. I have been an exhibitor at their fairs for 15 years, and this year had six entries in four departments, and know something of their management, and I am compelled to say that I have never seen a fair so badly managed as their last. They have shown a total disregard to the interests of the majority of the exhibitors, both in making their examinations and in accommodating them with space. The consequence of this mismanagement is that a new society is forming, to be called the "Mechanic's Association," which will pay a little more regard to the interest of the Mechanic.

S. T. MCDOUGALL,

333 Broadway.

New York, Nov. 10, 1856.

### Stoves Economising Heat.

It is well known that cylindrical stoves give out the most heat, and have the best draft, but there are few who seem to know the reason why. They do not seem to be aware, at least, that there is anything in the principle of their construction which imparts to them such qualities. Stove manufacturers cannot be accused of professing too much scientific knowledge regarding the best form of stoves, or we would not see so many blunders committed by them in casting so many with square and rectangular furnaces. This is especially the case with cooking ranges and stoves,—their fire-boxes are constructed on wrong principles.

The reason why a cylinder stove gives out so much heat, and tends to produce such a good draft, is owing to the sides of its fire-box or furnace being concave in form. Heat, like light, may be concentrated by concave mirrors, hence the heat is more concentrated in stoves which have concave, than those which have square fire-boxes. The rectangular form of fire-box may be more convenient for cooking ranges, but there is no excuse for constructing the furnace of any parlor or other heating stove of a square form.

The fire-bricks for lining stoves should be fluted. Bricks with plain surfaces are not so durable as the fluted kind, because the latter tends to prevent the adherence of clinker.—Some bricks for stoves are actually cast with convex surfaces, as if designed for scattering the rays of heat, thus exhibiting ignorance of the laws of heat.

Bright metal surfaces do not radiate heat so well as dark, dull surfaces, therefore Russia iron in stoves and pipe does not radiate so much heat into a room as common iron.—Those surfaces which radiate heat most efficiently also possess the power of absorbing it, and *vice versa.*

As the intensity of heat varies inversely as the square of the distance from the radiant point, it is evident that the nearer the stove is placed to the center of the room, or space which it is designed to heat, the more uniform will be the temperature of the whole space and not only so, but a greater amount of heat will be economized.

Stove manufacturers have devoted an immense amount of attention to elaborate the surfaces of cast-iron stoves, and to produce an incalculable amount of complicated forms, but not much to produce stoves based upon the philosophy of the laws of heat. We hope that more attention, scientifically, will hereafter be devoted to this great and important bnrach of American manufactures.

### Pure Water and Health.

At the late meeting of the British Association, Dr. Lankester exhibited some water taken from a well at Cirencester. The water from this well had been the cause of illness in a family which had partaken of it. Although at first clear, after standing a little time it exhibited the mycelium of a fungus. This water had been sent to him for examination, and he had been struck with the resemblance of the fungus to that of one which he had found in the well-water of Broad street, Golden Square, the drinking of which had been undoubtedly connected with the outbreak of cholera in that district in 1854. This well had subsequently been found to have received into it the contents of house drainage. He had now discovered that the well at Cirencester had also received into it a certain amount of house drainings. He related other cases in which fungi appeared in contaminated water. None of the waters mentioned exhibited any injurious constituents that could be discovered by chemical analysis; before chemistry could detect them they had lost their injurious properties, and the microscope alone could realize their presence.

*Tests of Pure Water.*—The following practical rules for testing the wholesomeness of water, says Dr. Marcet, will be useful :

1. The water must be perfectly colorless and transparent, leaving no deposit when allowed to stand undisturbed.

2. It must be quite devoid of smell.

3. When litmus paper is immersed in the water, the color of the paper must remain unaltered.

4. The water when boiled must not become turbid.

5. About half a tablespoon of the fluid being evaporated to dryness on the spirit lamp, there must be a slight residue left at the bottom of the spoon not turning black from organic matters.

6. The residue obtained by evaporating to dryness a sample of the water in a porcelain cup upon the tea urn, must not become black on the addition of a solution of sulphuretted hydrogen.

### Yankee Ingenuity.

It is said that Mr. John E. Gowen, of Boston, Mass., who is now in Russia, has contracted with the Imperial Government to raise the ships of war and other vessels, 52 in number, sunk in the harbor of Sebastopol during he siege. Mr. Gowen, it will be remembered removed the wreck of the steamer *Missouri*, from Gibraltar Bay, after all the efforts of British engineers for that purpose had failed.

### Collision at Sea.

The new French steamship *Lyonnais*, which left this port for Havre on the 1st of October was run into on the same night by an unknown ship, and, it is believed, went to pieces. Sixteen of the crew and three passengers picked up in a boat by the ship *Elsie* have been brought to this city; the others and some of the crew—40 in all—perished.

The *Great Eastern* steamship is to have ten large boilers, each weighing 38 tuns—or 380 total. These boilers have been lifted into the vessel one by one, by a steam crane, and laid down in the exact places they are designed to occupy.

Oxygen and chlorine, at a strong heat, decomposes the fluoride of calcium; the gas set free is fluorine.

The fluoride of calcium is an ingredient of bones, and is chiefly found in the enamel of teeth. It is a very abundant mineral.

One grain of hydrogen combines with eight grains of oxygen to form water. As no other element takes up such a large proportion of oxygen, this is probably the reason why the combination of hydrogen and oxygen is attended with such an intense heat.

During the voyage of the *Merrimac* steam frigate to England, the brass seats of the air-pump foot valves gave way and were crushed downwards.

The Franklin Institute Fair is now open in Philadelphia, and has been pronounced to be superior to any of its predecessors.

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# New Inventions.

### Improvement in Manufacturing Cast Steel.

The following is the description of a method of making cast steel, for which a patent has been recently granted to G. Brown, of Swinton, England, and described in the last (October) number of *Newton's London Magazine*:—

"The patentee puts into a common melting pot charcoal bar-iron, clipped in pieces, of about one and a half inches long, and adds thereto good charcoal pig-iron, in the proportion of one part, more or less, by weight of pig-iron, to three parts, more or less, of the clipped bar-iron. This combination of metals is melted in the usual manner, and then run into ingot molds. By this process cast-steel is obtained, suitable for any purpose to which cast steel, made on the old plan, can be applied,—the various qualities of steel required being obtained by slightly varying the proportions of the bar and pig iron. Taking 40 pounds weight as the standard of an ingot, from seven to twelve pounds of pig metal are used, and the remainder is made of bar-iron; these proportions would produce a cast-steel suitable for most purposes. Thus, for cast steel to be manufactured into edge tools, ten pounds of pig metal are added to thirty pounds of bar iron. For table knives, eight pounds of pig metal are combined with thirty-two pounds of bar-iron; and for hard steel, twelve pounds of pig metal are added to twenty-eight pounds of bar iron. But as almost all irons differ in hardness and quality, these proportions must, to a slight degree, be modified according to the judgment of the melter."

The nature of this improvement consists in smelting charcoal bar and charcoal pig iron together. If the mixture of these two kinds of iron can produce good cast-steel, the invention is a good one on account of its great simplicity.

### Supports in Coal Mines.

A correspondent from Wheeling, writing to the Cincinnati, Ohio, *Inquirer*, states that the coal mines near Wheeling are now very valuable. In describing the process of mining, he says:—"The rock over-bead is supported by beams resting upon posts—a very necessary precaution, for it sometimes gives way. As the workmen spread their excavations, on every side through the strata, they put up supports for the roof."

This is the old-fashioned method of mining coal, but it is not a good one. Wooden posts put in to support the roof are liable to decay, and thus cause accidents by the falling down of the roof, the best plan of supporting which is to leave posts or pillars of the coal standing; this is the improved method of coal mining.

### Effects of Nicotine.

The New Hampshire *Journal of Medicine* thus describes the effect of tobacco juice on snakes:—

"A black snake about six feet in length, which had been captured, was grasped by one hand around the neck and some tobacco juice thrown into its mouth. After writhing spasmodically a few moments the snake became rigid, and after its death actually retained the position in which it was held, its head elevated from the ground and his body curled around beneath. The experiment has been tried successfully on several smaller snakes, and other reptiles, in preparing them for cabinet preservation."

### Self-Acting Carriage Gate.

Our engraving illustrates the invention of J. A. Ayers, for which letters patent were granted January 22d, 1856.

The gate is made in the common manner. It is opened by the weight of the vehicle, whose wheels, in approaching the gate in the direction of the arrow, strike the hinged plates, A, and depress them. Plates, A, are connected, by means of rods and cranks, B C, with a crank at D, which is attached to the lower extremity of the inner end of both gates. By the depressing plates, A, the gates are caused to swing open, and fasten on the catches, E. The gates are so hung that they will close by their own gravity when the catches, E, are unfastened. This unfastening is done by depressing the rails, F. The catches, E, are connected by means of rods, G H, and cranks, I, with rails, F. When the carriage has passed through the gates its wheels strike one of the rails, F, and unfasten the catches, E, whereupon the gates, being liberated, close. G′ are springs, which raise the front end of catches, E, after they have been depressed. Cranks, B, are weighted so as to throw up plates, A, after they have been depressed.

## SELF-ACTING CARRIAGE GATE.

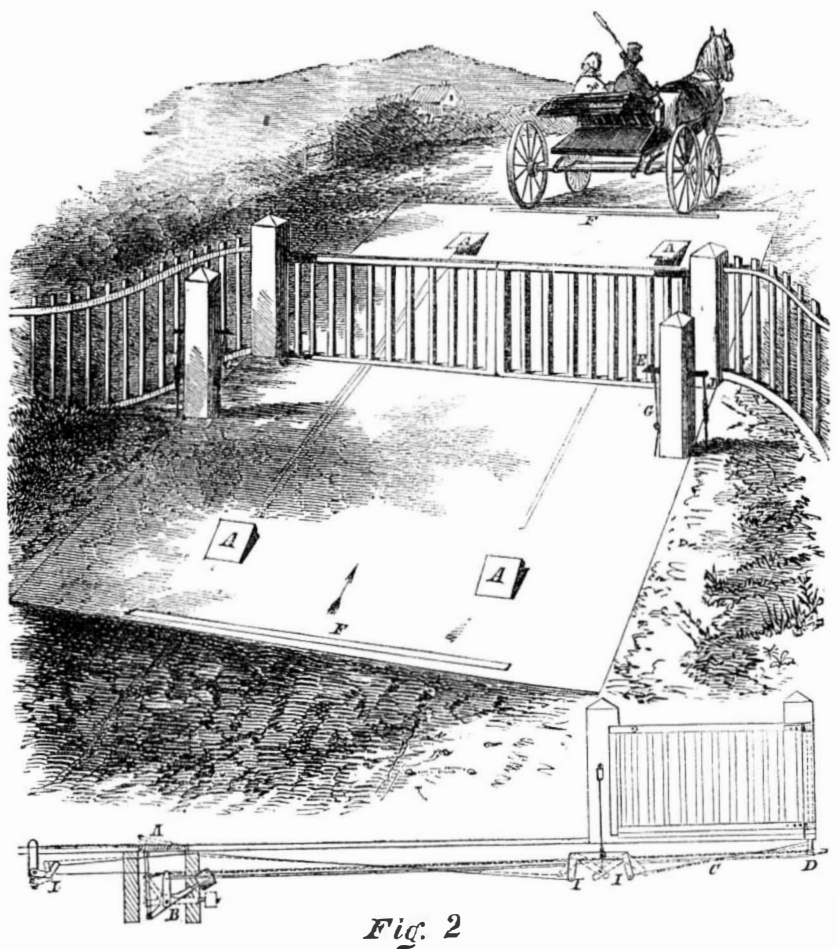
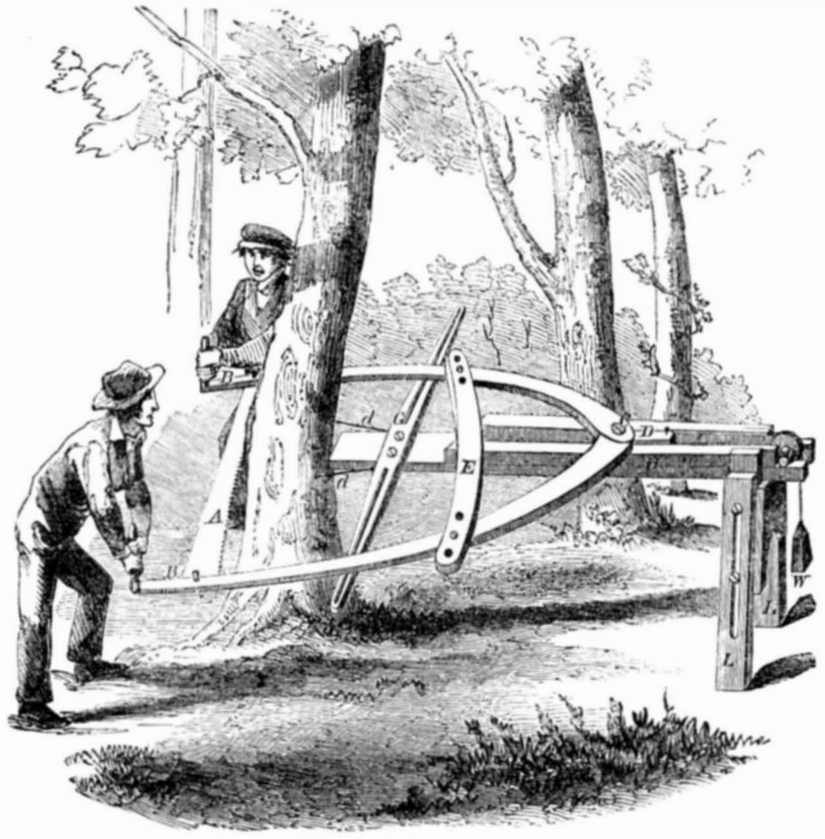


*Fig. 2*

The above is a very cheap, simple, and effective improvement. It has been introduced, we understand, in several localities, with much success. There is nothing about it liable to get out of order. Its convenience and advantages are obvious. Address the inventor at Hartford, Conn., for further information.

## MATHER'S TREE SAW.



### New Tree Cutter.

This figure represents the machine, and its application to the sawing of trees, for which a patent was granted to E. Mathers, of Morgantown, Monongalia Co., Va., on the 18th of March last.

This machine consists of the saw with its frame, and a trestle with its appendages. A is the saw, which is of a concave form. B B are its curved arms, secured at the apex by C, a pivot bolt. E is an adjustable cross bar. The saw can thus be easily adjusted to any desired tension. These parts constitute the saw frame. The fulcrum pin, C, passes through the guide block, D, which slides in a channel in the trestle, and has a weight, W, secured to it by a cord passing over a pulley. This weight, by its tension on the fulcrum block, D, feeds the saw forward to its work as it cuts into the tree. L L are the legs of the trestle. They have vertical slots in them for securing the saddle, F, by bolts, at different hights. H is the trestle reach or bearer; it rests on the saddle, F, therefore it is raised and depressed with the adjustable saddle. The arch extends to the tree to be cut down, and on its front end is one or more dogs, which are driven into the tree to hold it firm; there are also two long side dogs, *d d*, for the same purpose. The cross bearer, G, is a support and guide to the arms of the saw as they are reciprocated back and forth.

The concave saw is the best for cutting down trees, but a convex one may be employed by inserting a wedge after the saw has entered the cut some distance. This sawing machine can also be applied to saw logs after the trees are felled. This is accomplished by removing the legs of the trestle, raising the bearer, H, vertically, making the long dogs, *d d*, the hypothenuse of a triangle, by forcing them into the log and holding it firm. The saw frame can then be worked vertically to cut the felled log, as well as horizontally to cut down the tree.

This sawing machine is very simple, is designed for hand work, and can be constructed by any carpenter, and by most of our farmers. It can be taken to pieces in a few minutes, carried conveniently from place to place, and also put up in a few minutes. A machine to be useful for sawing in the forest must be cheap, simple, light, and easily adjusted—objects which this machine accomplishes; also the employment of manual labor to good advantage in sawing. For more information address the inventor at Morgantown, Va., as above.

### New Size for Cotton Warps.

The Liverpool (Eng.) *Mercury* states that John Leigh, surgeon, of Manchester, has proposed as a substitute for flour paste to dress cotton warps, the *silicate of soda*. It also states that several manufacturers have been engaged in the experiments necessary to test its efficiency, and 400 to 500 pieces of cloth have been made with this description of size. The cloth in which it has been used is quite equal in color and softness to the other, while experiments have shown that it does not interfere with the strength of the fabric, or produce any deteriorating chemical effects. It is calculated that a saving of 25 to 50 per cent. will be effected by the adoption of this instead of flour size, whilst the quantity of flour which will be set at liberty for the purposes of food would supply the people engaged in the cotton manufacture with bread.

### Machinists' Rules and Squares.

We would direct the attention of machinists, carpenters, and all mechanics interested in having accurate measures and squares, to the advertisement of Messrs. Darling & Schwartz, of Bangor, Me., in another column. We have examined their steel try squares, rules, &c., and can give them a good recommendation for accuracy and excellent finish.

### Trees on Railroads.

The *Railroad Record* states that the Illinois Central R.R. Co. have adopted the expedient of planting locust trees on each side of the road. The object of this policy is to provide timber for a future supply of ties. The managers of this railroad have exhibited a wise and sagacious course of action. All our railroads should do so likewise.

### Explosion of a Steam Fire Engine.

The *Miles Greenwood* was taken out by the company for drill on Wednesday, when she again proved a failure. Before the water went through the hose, the top of the pump blew off with much violence, and rendered the engine utterly incapable of further action. Several persons narrowly escaped injury by the explosion, and some were rudely jostled and trampled upon by the haste of the crowd in attendance to make their exit from all chance of danger.—*Boston Transcript.*

### Ship Ventilation.

To ventilate a ship properly, is to make a passage at the base of the hold for the free distribution of pure air, and to allow the noxious vapor to escape out of the hatches. The philosophy of this may be seen by holding a lighted candle at the top of the door of a close room without fire, when the flame will be blown outward toward the hall; if the candle be held at the bottom of the door, the flame will be drawn inward.—*U. S. Nautical Magazine.*

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Scientific American.

NEW YORK, NOVEMBER, 22, 1856.

### The Brutality of the Bar.

This is a subject which, though apparently foreign to our very general legitimate literary labors, is not really so; we are glad, however, that it is one of which we are seldom led to take cognizance. Our attention has been directed to it by the speech of Edw. N. Dickerson, the counsel for Sickles in the patent case described in our last number. This speech has been published in several of our daily papers, with the object, apparently, of showing the public a specimen of that eloquence which gained this famous case. We say, the *apparent object of its publication*, as none of the speeches of other counsel have been given to the public.

In reading this speech no one can fail to receive the impression that it is a ferocious personal attack on the defendant's principal witness—Horatio Allen, of the Novelty Works this city. He is held up not only as a very ignorant engineer, but as an engineering Charlatan; and it is insinuated, that the *Pacific*, and boldly charged that the *Arctic*, steamships were lost through "his willful ignorance" of marine engineering.

No one can now tell how the *Pacific* was lost—that revelation must wait till the Day of Judgment; but it is said that the *Arctic* could have been kept afloat by her air pumps if they had been properly constructed. They were sixty inches in diameter and five feet stroke, but had ports, the speech says, "of only seven inches diameter, and that, had they been larger, the pumps were of sufficient capacity to have thrown out as much water in forty minutes as would have equalled the entire weight of the vessel." We do not know what the size of the *Arctic's* air pump ports were, but if these pumps were sufficient to have maintained the proper vacuum in the condensers, then they fulfilled their specific duties. We have never heard that they did not fulfil those conditions, and without evidence adduced to prove their inefficiency we consider the charge against Mr. Allen to be wanton. It is one of the most serious charges that possibly can be made against any man as it makes him responsible for that great calamity which cast such a gloom over our city, and which has caused so many to go mourning ever since, for "the beloved and lost." In recurring to the accounts given of that accident, at the time of its occurrence, we find that the vessel was driven forward, forcing water into the hole in her bow at the rate of about twelve miles per hour, or 1056 feet per minute, instead of using the pumps efficiently to discharge the water.—Surely Mr. Allen was not to blame for this. The question at issue was: "whether the valve motion on the steamboat *Metropolis* was an infringement of the Sickles' patent." The jury decided it was, and therefore we acquiesce in that decision, but the Court should not have allowed such attacks by counsel, all foreign to the case under consideration, for the purpose of impressing the jury.

It is not an uncommon custom for counsellors to indulge in the grossest vituperation, and to perpetrate the grossest libels against witnesses, and be shielded in their conduct under the sanctity of the Court. Such conduct is sacrilege, and should be repressed. To gain their cause, *no matter how*, appears to be the most sacred object of their efforts, but we hold such conduct to be disgraceful in any man, and so does the public.

In reading many of the speeches of counsellors before juries, we are of opinion that it would be far better for truth and justice sake if the evidence of the witnesses were simply read over to the jury by the Clerk of the Court, and their decision based upon it instead of being swayed by such appeals to their passions, as in the speech which has formed the subject of this article.

We have nothing to say of Mr. Dickerson, personally but we regard his speech as another among the many exhibitions of brutality too often displayed by those who occupy a high position in the legal profession.

### Ethnology, or the Races of Men.

It appears to us that modern Ethnology is something like spiritualism; neither of them are new subjects, but as treated by their students they develope many new absurdities. A few years since the London *Times* stigmatized the Celtic race as being inferior to the Saxon, when Dr. McElheran, of Ireland, came to the defence of the former, and proved satisfactorily to himself and many others that the Celt was the model type of man, the superior race, and the Saxon a very inferior sort of mankind. The Dr., who has now made this city his residence, is an enthusiastic and learned ethnologist, and delivered a lecture on the subject on the 5th inst., before the Academy of Medicine in the chapel of the University. He had a large and learned audience, and his lecture was an able one, occupying two hours in delivery, and was well illustrated.

He contended for the unity of the human race, but also for the superiority of the Celtic as being the central type, with oval head and most perfect form as compared with the Goths and Kalmucks. He claimed the white Americans for Celts, and asserted that their heads were a long oval, like the Welsh, Irish, and Highland Scots, while the Saxons and Germans had short, broad, distorted crania, like savages.

It is a positive fact that every race thinks itself superior to all others; and the doctor, being a Celt, views all crania through his own peculiar vision. An Anglo-Saxon boasts of his race as superior to all others, while the Celt considers himself the model man. This pride of race is as old as the hills, and just as absurd as it is old. What is a race? A people speaking a peculiar language and of a certain habitat. At one time, while the Egyptians were the dominant race, they considered themselves the model type of man. Then the Greeks became the most renowned of peoples, and considered themselves the model race, and all others as barbarians.—Whatis the Greek race now? A robber clan. Then came the Roman race, which subdued the Greek, and it was the model type in its day. The old Roman was noble, virtuous, and brave; a lover of rational freedom, a warrior and statesman. Well, this once model race, so noble and great, is now distinguished for hand-organs and monkeys—the grinders of penny music for the multitude. Thus it has been with the races of men during the past—the dominant one in its day always considering itself the model one.

At present the German believes the Teutonic to be the model race; the Englishman and American believe the Anglo-Saxon to be the model type; while the French and Irish boast of the Celt. The truth is, that virtue, bravery, and industry are the qualities which make a model man and a model race. These are the qualities of character, which in the history of the world, have elevated one race and nation above another. If such qualities were race peculiarities, then the nation first dominant would always have been dominant; the Egyptian would still have been the Prince of Men.

### Flying.

An invention that would enable man to fly would be a capital thing. What a revolution it would cause in all sorts of traveling now practiced for conveying passengers. The steamboat and the railroad would then become mere baggage carriers, and their present dignity and functions as carriers of human freight would disappear beneath the overshadowing dignity of man skimming the blue azure above, and spurning rocks, trees, seas, and rivers, and rough and crooked roads on his journey. This subject has engaged the attention of many persons from time immemorial, even extending away back to the days of Grecian Mythology, when one of their semi-deities succeeded in the attempt, but as his wings were only fastened to his shoulders with wax, he foolishly, it is related, ascended too high, when the heat of the sun melted it, and down he dropped into the sea, and that was the last that was heard of him. In modern times not a few baloonists have really met with the same fate, though not from the same cause; but the many misadventures of old aerial navigators do not seem to have discouraged others from pursuing the same field of delightful and elevated investigation. This shows us that the bravery of man in the present day is equal, if not superior, to man in any age, and at once knocks into *pi* the accusation which some writers have made of man's degeneracy in hardihood on account of modern civilization.

These remarks have been called forth by the great number of successful balloon excursions which have recently taken place in various parts of our country. On Wednesday last week Mons. Godard made an aerial excursion from Philadelphia with four passengers aboard, when he showed them what a balloon could do under skillful management. At Fellowship, nine miles from Philadelphia, his carpet-bag fell overboard, but he was determined not to lose it. He immediately opened the valve, and the balloon descended with much ease in the field of Amos Roberts, where it remained until a man was sent back for the lost property. While here a number of people collected, and invitations were quite numerous for the party to stop and take supper, but the shades of evening coming on, the voyagers were desirous of advancing and enjoying a ride by moonlight. They therefore mounted the balloon again, and away they soared gracefully over the country to Mount Holly, N.J., where they descended, all safe and sound.

Many improvements have, no doubt, been made in the art of ballooning during the past ten years, but it has not been made a really useful art yet. M. Godard, however, appears to be in a very fair way of making it something more than it hitherto has been.

### Bessemer's Patent.

On our claim page it will be observed that H. Bessemer has obtained an American patent for his improvement in the manufacture of iron. This claim is based upon a scientific discovery in the manufacture of the iron; namely, producing combustion without fuel, by forcing air, steam, or other gases through molten iron in a vessel, to supply oxygen to the carbon in the molten crude metal, and thus produce combustion to burn out the excess of carbon in the crude metal. The claim is based upon this idea as his discovery, not that he was the first that used air or steam in this mannner, but that he discovered the cause of the effect produced by driving oxygenated gases through molten iron.

It was Mr. Bessemer's paper read before the British Association for the Advancement of Science, which produced the recent excitement regarding this new process. There really seems to be a strange complication of the question between his patent and the prior one of Mr. Martien. Jets of steam and air forced through the molten metal as it is run from the smelting furnace is the substance of Mr. Martien's claim.

The peculiar action discovered by Mr. Bessemer, as embraced in his claim, is only obtained by employing Martien's process.—Query:—How is Mr. Bessemer's claim to be sustained, as he has invented no new process, and how can a new manufacture be obtained by his discovery, as demanded by the Patent Law?

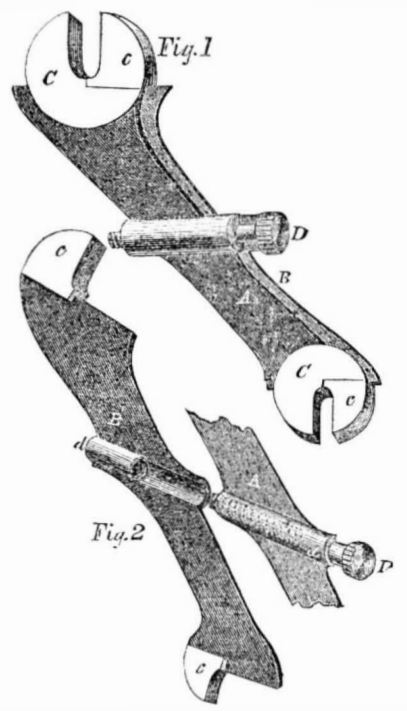
### Scientific Men and Practical Men.

A correspondent signing himself "Telegraph," writing from this city to the Philadelphia *Ledger*, censures Professor Bache for not giving Prof. Morse more praise for his invention, in his address before the American Institute. If Prof. Bache did not mention the name of the inventor of the Electro-Magnet Telegraph as forcibly as he might have done, this, we presume, was not done disrespectfully. The principal fault which we find with Prof. Bache's lecture is the idea which it seems to convey respecting practical men, namely, that useful inventions have all been based on some discovery in science previously made by men known as Professors of the Sciences, such as Ampere, Oersted, Henry, &c. In some cases this has been true, in others not. The Morse telegraph is based upon the invention of Prof. Henry in the electro-magnet, and if *it* had been patented for the purpose of producing mechanical effects, moving machinery, &c., all the telegraph companies in our country would have had to obtain his consent to its use. But it is well known that the great majority of useful inventions have been made by practical men without much aid from men of great scientific reputation.

By experiments, practical plodding men have made the majority of discoveries in science. Oliver Evans, Fulton, Arkwright, Watt, Trevithick, George Stephenson, and the majority of great inventors made improvements which are simply the facts of science.

Many persons make great mistakes respecting what science is. They seem to consider it something above and beyond practical operations, but the fact is, it simply consists in the classification and explanation of discoveries—inventions. A machine truly practical is truly scientific.

### Diagonal Adjustable Wrench.




These two figures represent Baxter's Diagonal Adjustable Wrench, patented on the 12th of February last. A B are two forged pieces of metal composing the entire wrench, with double jaws. Each jaw is divided into two parts, C C, the larger part of the jaw belongs to the half, A; the parts, *c c* belong to the other half, B. At the middle of the wrench, inside, is a small socket, *d*, on A, and another, *d*, on B. The screw, D, is secured in the socket of A, and passed into the other, which has a thread in it. The two pieces, A B, are placed on one another and the screw, D, turned in its socket, and thus we have the whole anatomy of the tool, figure 1 showing the two parts secured together, forming the wrench, and fig. 2 two parts separate, and adapted for being secured together.

By turning screw D, the jaws are extended and contracted by the socket nut, *d*, moving the part B, in a diagonal direction on the part A. It is a most simple and convenient S wrench; and the set screw, D, is so placed that but little strain comes upon it, which makes it very durable. Being easily adjusted by screw D, to operate on different sized nuts, its adaptability for railroads, machine shops, and all purposes for which tools are used, is apparent. Six different sizes of such wrenches are manufactured to render them suitable for all mechanical trades.

More information respecting them may be obtained by letter or otherwise, from O. McComb, No. 190 West street, this city.

**SPLENDID PRIZES.—PAID IN CASH.**

The Proprietors of the SCIENTIFIC AMERICAN will pay, in *Cash*, the following splendid Prizes for the largest Lists of Subscribers sent in between the present time and the first of January, 1857, to wit

| | |
|---|---|
| For the largest List, | $200 |
| For the 2nd largest List, | 175 |
| For the 3rd largest List, | 150 |
| For the 4th largest List, | 125 |
| For the 5th largest List, | 100 |
| For the 6th largest List, | 75 |
| For the 7th largest List, | 50 |
| For the 8th largest List, | 40 |
| For the 9th largest List, | 30 |
| For the 10th largest List. | 25 |
| For the 11th largest List, | 20 |
| For the 12th largest List, | 10 |

Names can be sent in at different times and from different Post Offices. The cash will be paid to the order of the successful competitor, immediately after the 1st o January, 1857.

☞ See Prospectus on last page.

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### American Institute Prizes.

The following are the lists of the Gold and the Silver Medals which have been awarded by the American Institute for novel machines and such like articles exhibited. A great number of good machines were awarded Bronze Medals; we would have published these with pleasure, but have followed our usual practice, and give only the gold and silver prizes, because our room is limited. A number of the machines exhibited had been awarded Gold and Silver Medals at some previous Exhibition, and only received Diplomas at this one; these we do not notice, because we published them when former prizes when granted. The Examining Committees have been rather dilatory in making their awards. This gives their actions, the appearance of great caution and due deliberation. We hope this has been so in reality.

#### Gold Medals.

Pinney, Youngs & Co., Milwaukie, Wis., Sawing Machine
C. H. Denison, Green River, Vt., Double Planing Machine with rotary bed for wood.
H. H. Crozier, Oswego, N. Y., Barrel Machine.
N. W. Robinson, Keeseville, N. Y., Barrel Machine.
Allen & Wheelock, Worcester, Mass., Breech-loading Rifle, &c.
Ames Manufacturing Co., Chicopee, Mass., for Ball's Patent Safety Steam Pump.
Lee & Larned, New York, Steam Fire Engine.
Fairbanks & Co., New York, Iron-Frame Railroad Scales.
Alfred E. Beach, Stratford. Ct., Printing Telegraph for the blind.
Bernard Hughes, Rochester, N. Y., Atmospheric Trip Hammers.
Chickering & Sons, Boston, Grand Action Pianos.
George H. Reynolds, Medford, Mass., Non-condensing Steam Engine.
John North, Middletown, Ct., Book-folding Machine.
Calvin Kline, New York, Marine Chronometers.
J. Gurney, New York, Photographic Portraits (untouched.)
Fire Engine No. 12. Brooklyn.

#### Silver Medals.

J. F. Starrett, New York City, Power Printing Press for Music.
James Frost, New York, Specimens of Electrotyping.
J. P. Humaston, New Haven, Ct., Compositors' Transmittors.
Calvin Kline, New York, Ships Binnacles and Compasses.
Daniels & Raymond, Woodstock, Vt., Cotton Picker.
Wm. Benjamin & Co., New York, Power Looms.
John Matthews, New York, Soda Water Apparatus.
Reeve & Co., New Yerk, Gas Regulator.
Benedict & Burnham Manufacturing Co., Waterbury, Ct., Brass Tubing, Sheet of Brass, Roll of Brass and Copper Wire.
Springfield Tool Co., Springfield, Mass., Engine Lathe.
Boston Steam Gauge Co., Boston, Mass., Steam Gauge.
Novelty Iron Works, New York, best Design of an Oscillating and Non-condensing Steam Engine.
Wm. S. Gale, New York, Steam Fire Regulator.
Steinway & Sons, New York, Grand Action Pianoforte.
Mason & Hamblin, Boston, Mass., Organ Melodeon.
R. F. Washburn, New York, Ships' Pump.
Fulton, Perkins & Co., Chicago, Ill, Taper Sawing Machine.
Wallace & George Bull, Towanda, Pa., Sawing Machine for stone or marble.
Starbuck Bros., Troy, N. Y., Stone Dressing Machine.
John Parshley, Fair Haven, Ct., Machine for Pressing Brick.
B. J. Burnett, Mount Vernon, N. Y., best Model of a Crane.
James Horner & Co., New York, best samples of Cast Steel.
E. A. Swan, Gowanus, N. Y., Marble Carving Machine.
Speed & Bailey, Jersey City, N. J., Copper Tubes.
E. N. Kent, U. S. Assay Office, New York, Gold Separator and Amalgamator.
E. M. Bullock, New York, Model of New York City.
Magnolia Cotton Gin Co., Bridgewater, Mass., Cotton Gin.
Silsby, Mynderse & Co., Seneca Falls, N. Y., specimens of Pumps.
John Matthews, New York, a self-acting machine for manufacturing soda water.
R. L. Allen, New York, Mowing Machine.
Silsby, Mynderse & Co., Seneca Falls, N. Y., Steam Fire Engine.
Taylor, Campbell & Co., Brooklyn, N. Y., Feed Pump and Fire Engine.
W. Hicks, New York, Percussion Caps.
Asa Landphere, Erie, Pa., Spoke Machine.
America Hoop Machine Co., Fitchburg, Mass., Hoop Planing and Pole Splitting Machine.
W. L. & D. L. Ormsby, New York, Automaton Sawer and Wood Splitter.
Vergennes Scale Co., Vergennes, Vt. Railroad and Hay Scales.
Sayfert, McMannus & Co., Reading, Pg., Machine for Planing and Turning Barrell Heads.

The following are the total number of Prizes awarded:

| | |
|---|---|
| Gole Medals, . . . . . | 19 |
| Gold Medals Certified, . . | 36 |
| Silver Medals, . . . . . | 100 |
| Silver Medals Certified, . . | 64 |
| Silver Cups, . . . . . | 17 |
| Bronze Medals, . . . . . | 215 |
| Diplomas, . . . . . | 392 |
| Books, (Vols.) . . . . . | 75 |

We have not given the Gold and Silver Medals awarded for agricultural specimens, or specimens of the fine arts. This is the reason why the total number differs from the number we have published of the two classes of medals.

One of our correspondents complains, in a letter in another column, of the management of the Fair, while other exhibitors have spoken of it highly. In the awarding of the prizes we expect impartiality—not perfection. If the Committees have erred under the first head, they deserve censure; but we are far from thinking that any member of the various awarding committees would designedly recommend premiums for articles of a manifestly inferior character to others on exhibition. There can be no reason for supposing that any such motives actuated the judgment o the committees. We understand, from experience that it is a delicate and exceedingly difficult duty to arrive at all times at results perfectly satisfactory in such examinations.

### Papers on Engineering.

At the late meeting of British Engineers, held in Glasgow last month, some very excellent papers were read, and the mechanics who attended it from all parts of the kingdom, met with great attention from the citizens. The following are condensed extracts of some of the papers:—

*Steam Riveting Machine*, by R. Harvey.—The principle consisted of a steam piston acting through a lever and an eccentric cam, by means of which the power was greatly increased at the end of the stroke, when the extra pressure was required for finishing the rivet. The machine was also adapted for punching and shearing the boiler-plate, so as to effect all the operations of boiler-making with one machine.

*Compressed Air Engine in a Coal Mine*, by Charles Randolph.—This engine was constructed to compress air to 30 lbs. on the square inch, for working a winding and pumping engine, fixed underground at the extremity of the colliery, the compressed air being conveyed from the surface by a pipe about half a mile in length. The object of the arrangement was a convenient mode of conveying power from the surface to the place required, as a steam engine underground was inadmissible, and it had answered the purpose satisfactorily, having been in constant use for upwards of six years without causing any trouble or stoppage. The pumps for compressing the air were of peculiar construction, having water constantly upon the valves, to prevent leakage and heating from the compression of the air.

*Dr. Boucherie's Mode of Preserving Timber*, by J. Reid.—This process consists in injecting the tubular fiber of the timber with a solution of sulphate of copper by hydraulic pressure from an elevated tank, the injected liquid driving before it the sap of the timber, and occupying its place. The process was most efficiently applied to the timber in the log before it was cut up, to insure the whole being fully saturated, and the effect had been found to be very satisfactory.

*Grooved-Surfaced Frictional Gearing*, by J Robertson.—This was a construction of wheels for transmitting power in place of cog-wheels. by having the surfaces grooved so as to fit into one another, and communicate the power by their friction or bite. The grooves were V-shaped, and formed so as to fit exactly into one another, the size of the grooves being proportionate to the velocity and power required. The advantages obtained consisted in the smoothness and uniformity of the motion.

*Steam Boiler with combined Internal and External Furnaces*, by John Stephen.—The principal object of this boiler is to economise space and cost of construction, by reducing the size of the boiler requisite for a given supply of steam, which was effected by a combination of internal and external firing furnaces being placed under the boiler, and also in internal flues. These were fired alternately, so as to effect a more complete combustion of the smoke; and it was anticipated that an advantage in the durability of the boiler would be obtained from the more equable heating of the exterior and interior portions. A self-acting feed apparatus was applied to the boiler, consisting of a small detached engine, the working of which was regulated by the hight of water in the boiler.

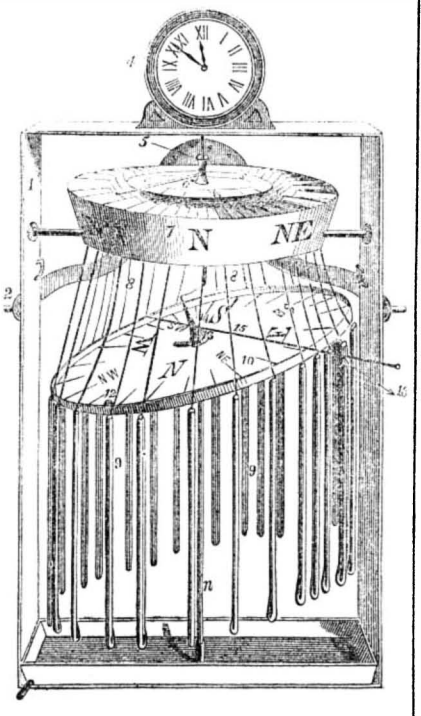
*Improved Locomotive Boiler*, by Walter Neilson. In this boiler a smaller semi-cylindrical portion was added along the top of the boiler, for the purpose of obtaining additional steam space, and the roof of the internal fire-box was made concave instead of flat, as usual, with the object of maintaining a greater depth of water upon the top, and increasing the depth of the centers of the roof-girders.

*New Locomotive Boiler*, by Alexander Allan.—This boiler was entirely cylindrical, containing the fire-box in the interior, and was designed particularly with a view to economy of construction, and increased strength and lightness.

*Steam Dash Wheel for Bleaching*, by J. Wallace.—This was a modification of the ordinary dash-wheel, by the introduction of steam into the interior, by which the bleaching process was enabled to be effected in a greatly reduced time.

### English Patents.

*Register for Indicating and Recording the Course of Vessels.*—This invention consists of a box about 18 inches square by 3 feet deep, supported on gimbols, 2, and secured to a bulkhead; on the top is fixed a meter, 4, turned by clock-work, which drops a small shot about every two seconds into the cup of a small tube, 5, fixed to a compass card, 6, secured horizontally on the radius of the true north point, and on the same plane as the center of support. The tube conveys the shot to the circumference over a cistern, 7, divided into cells, representing every quarter point of the horizon; from the cells the shot are conveyed by short tubes, 8, to a like number of bags, 9, suspended at every quarter point round the circumference of a disk, 10, poised on a pivot, 11, the disk having a raised rim, a ball, 12, resting on its surface, which is marked with the points and degrees of the horizon; its center, 13, is made to protrude or to recede by a screw, and is surmounted by a tongue, 14, attached at its end by a piece of silk to a point under the center of the cistern, and vertical to the pivot which supports the disk. Across the disk, and working round the center is a balance beam, 15, with its weight, 16, similar to the common steelyard; under the bags is a pan, 17, with its spout for collecting the shot when the bags are emptied.




By this arrangement, the north point of the cells and disk being placed in a line with the keel of the vessel, any course the ship may steer is registered, the disk being marked in reverse, the westerly points on the easterly side, any deviation of the north point of the needle with its tube from the line of the keel will cause the shot to fall into the cell, denoting the course the ship is steering, and thence fall into the bags; the small ball, by its gravity will show at sight the point of greatest dip or the mean direction the vessel has gone, but is more accurately shown (taking the small tubes out of the bags in which they work, and placing them on the hooks at the side of the box; the disk is then perfectly free, resting only on its center,) by applying the beam and its weight to balance the disk, which is correctly shown. When the point of the tongue is under the point on the cistern's center, the true course is shown to a degree at the point the beam crosses, and the distance in the same proportion may be obtained thus:—the weight of the shot being known, and the whole distance by one of Massey's Patent Logs, as the whole distance run is to the weight of the shot run out, so is the weight of shot shown on the balance beam to the true distance.

The distance and bearing may be obtained by means of a vane passing through a tube from the deck to the keel of the vessel—the action of the vane being brought into the vicinity of the instrument. This is not shown in the illustration; it shows the instrument's use in connection with Massey's Patent Log only The value of this contrivance, which is by no means expensive, is obvious. The course of a ship through the water is most generally variable, as also the rate of speed; much is consequently left to the judgment of the shipmaster and the officer of the watch, who are liable to great error in thick, stormy, unsettled weather, necessarily causing delay, care, and anxiety on approaching port; most reliance being placed on astronomical observation, which is often unattainable for some days, when making the land. By its means, the dead reckoning is much more certain; its advantage is further manifest in helping to elucidate the action of currents on the surface of the ocean.

The illustration shows the disk divided for the sake of clearness into points of the horizon, only the slight vibration caused by the falling shot, assists in keeping the needle more susceptible of directive force, and they may be so reduced in size as to cause little or no vibration. The intervals of time in their dropping being lessened, the same weight obtained for distance and direction as with the larger shot (the largest size being much less than a grain) the pivot which supports the compass card is made with a socket similar to a pencil case for renewing the point, as after much action it becomes blunted, and is liable to set in smooth water, as may be seen by comparing two ordinary compasses under such circumstances. The course obtained will be corrected for variation of the compass, the tube being placed over the true north point. The application for obtaining the leeway may be much simplified, and conducted to any part of the ship where the instrument may be placed. By the application of an oscillatory box divided into cells, the true angle of ascent and descent from the plane of direction, caused by the swell of the ocean, may be obtained and applied as a correction to the distance by Massey's Patent Log. The application of the instrument on board iron vessels in obtaining the error for local attraction when placed in different parts of the ship and the course registered is obvious.—[London Engineer.

### Great Earthquake and Volcanic Eruptions.

By the latest news from Europe we learn that severe earthquakes had occurred in Egypt, and that the shocks were felt in Greece and Italy. Two hundred houses were demolished in Cairo. The city of Rhodes was in ruins. Some damage was also done in Smyrna. The earthquake also did great damage in Malta, Messina, Pozzalo, Syracuse Candia, and other places in the Mediterranean. Several vessels in the Mediterranean felt the shock severely, and on board many of the steamers the machinery was stopped. The shocks extended from the 11th to the 16th of October. During the whole time Mount Etna was emitting dense volumes of smoke.

The seats of old earthquakes appear to be the localities of the most recent in the Old World. Thus the city of Rhodes, famous of old for its commerce, had the entrance to its harbor spanned by a brazen statue of such hight that ships sailed under its legs, which, history tells us, was overthrown by an earthquake 224 B. C. The city itself, by the same earthquake, was reduced to ruins.

But how different was the Rhodes of old from the modern city. Two thousand and eighty years ago it was one of the most distinguished cities in the world for sculpture, painting, science, learning, and commerce, and its calamity created the deepest sensation throughout all Greece; but the destruction of the modern Rhodes has caused no general sensation whatever, because it was but an insignificant place—"fallen from its ancient high estate." Destruction has come upon many distinguished cities in a single night It was the case with Babylon, Rhodes, and Pompeii.

### Bronze for Small Castings.

Take 95 parts of copper, by weight, and 36 parts of tin, and fuse them together in a close crucible.

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J. R., of Ill.—You had better submit your plan to the Secretary of War, and get him to advise you in regard to it. If it is worth anything you ought to be encouraged.

The South Western Min. and Manf. Co., located at Nashville, Tenn., wish to obtain the present P.O. address of Jose Johnson, patentee of a brick machine. Can any of our readers furnish it?

J. R. K., of Georgia—Gilt frames must be varnished in order to allow of their being washed. Fine copal varnish is the best to use. With a sponge, soap, and cold water, such frames can be cleaned so as to remove fly specks. Unvarnished gilt frames of looking-glasses and pictures should be covered with white cotton gauze.

W. L. Waters, of Three Forks, Tenn., desires information in regard to an elastic sash cord impervious to the action of the atmosphere, to be attached to each sash around two vertical and one horizontal pulleys. We would inform Mr. W. that we do not know anything about the saw mill of Mr. K.

Observer—The communication of Mr. Miner, to which you refer, was not written by us. He is responsible for his own views. We cannot become so ourselves.

C. C, of Mass.—Ideas are not patentable. The one who first renders practicable an improvement, or puts it into some tangible shape, is considered its first inventor.

J. of Mass.—Air is permanently elastic. A patent could not be obtained for a machine to produce ice, such as you describe, for it could not produce it.

A. A. of Mass.—You will find a good treatise on photography in Dr. Gregory's Chemistry, published by Barnes & Co., John street, this city.

D. B. T. of O.—If you will send us your Letters Patent we will inform you at once the cost of getting up an engraving to illustrate your invention. A model we should prefer, hower, to make the sketches from, if you have one.

F. P. of N. Y.—You can see a member of our firm at the office, any time you may choose to call between the hours of 9 o'clock A. M. and 4 P. M.

C. H. H. of N. H.—Your case will meet the attention you solicit for it.

D. N. B., of N. Y.—The idea of constructing safe locks with clock-work attachments. so that the lock cannot be operated with even the key belonging to the lock, except at a certain time or stage of the operation of the mechanism, is not new, but your mode of construction may be. Send us a model.

T. D. of Ct.—We do not know of such a work as you speak of. We think you cannot procure it.

J. C. C. of Cal.—We send you a copy of the Patent Laws, and have entered your name for two copies of the Sci. Am. to the amount of $5, as we cannot supply you with a work on Pattern Making. There is no such work that we know of. Wheeler, Wilson & Co., I. M. Singer & Co., and Grover, Baker & Co., of this city, are manufacturers of good sewing machinery.

E. B. W. of Ohio—If you write to Prof. Henry, of the Smithsonian Institute, he will forward you a pamphlet containing instructions for preserving specimens of natural history.

R. H. Moore, of Fultonham, Ohio, wishes to procure the best shingle machine to be had—simple and cheap.

Wm. F. Greeley, of Nashua, N. H., wishes to ascertain about the best wood-burning lime kilns in use.

A. C., of Ill.—Your article is pleasantly written, but it does not furnish any practical suggestions that would be of general benefit to our readers. The publication of your improvements in casting large bodies of iron and brass would not prevent you from taking out a patent afterwards. We do not advise you, however, to make a public exposure of your invention, providing you intend to patent it, as it might occasion you difficulty. We advise you to correspond with the Novelty Iron Works, this city, in regard to it.

D. H. C., of Mass.—We are much obliged for the interest you manifest in the good reputation of our paper.—We do not mean to err on the wrong side, in admitting notices or advertisements into its columns. Undertaking to correct errors in this regard will usually greatly magnify the evil complained of. Wars of personality through the columns of a newspaper are always out of place.

D. B., of D. D.—Yours has been received, and will meet with attention.

A. P., of N. Y.—Do you produce a new and useful result by the use of camphor, as described by you? If so it is patentable; but we cannot conceive how the mixture can be useful.

C. C. H., of Mich.—Within the past year we have published in the list of patent claims three corn husking machines that we now remember, viz.: Oren Stoddard, Busti, N. Y., W. H. Smith, Newport, R. I., and H. P. Gerrish, Boscawen, N. H. You can find their claims by referring to the list as it is published in this journal.

W. M., of Cal.—Without an engraving or drawing it will be impossible for us to show you the arrangement of Atkin's raking attachment. It was patented December 21st, 1852, and is fully illustrated and described in No. 6, Vol. 9, Sci. Am. J. S. Wright, of Chicago, Ill., will supply you with any additional particulars you may need. There are several patents on raking attachments besides this. The use of well-known machinery for new purposes could not be patented.

Money received at the Scientific American Office, on account of Patent Office business for the week ending Saturday, Nov. 15, 1856:—

G. B. McC. of Me., $30; J. P. G. of Ky., $30; E. & J. B. of Pa., $25; V. N. M. of N. C., $25; S. E. P. of Tenn., $30; G. W. F. & Co. of Ind., $30; J. P. of N. J., $100; L. Van H. of Conn., $25; B. & D. of N. Y., $10; W. F. F. of Ill., $25; P. F. E. of Ill., $25; F. F. H. of O., $25; J. A. T. of Pa., $25; A. S. B. of Mass., $25; J. S. of Mass., $50; S. W. R. of Mass., $25; A. F. W. of L. I., $30; A. M. of N. Y., $30; E. S. S. of Conn., $55; D. W. of N. J., $55; J. S. of O., $12; J. H. of N. Y., $30; T. F. T. of N. Y., 930; G. D. of Cal., $29; T. G. of R. I., $30; L. M. P. of Wis., $55.

Specifications and drawings belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, Nov. 15:—

E. & J. B. of Pa.; L. Van H. of Conn.; P. F. E. of Ill.; J. A. T. of Pa.; J. F. H. of O.; V. N. M. of N. C.; S. W. R. of Mass.; J. S. of O.; A. S. B. of Mass.

### Important Items.

Subscribers to the Scientific American who fail to get their papers regularly will oblige the publishers by stating their complaints in writing. Those who may have missed certain numbers can usually have them supplied by addressing a note to the office of publication.

Inventors Sending Models to our address should always enclose the express receipt, showing that the transit expenses have been prepaid. By observing this rule we are able, in a great majority of cases, to prevent the collection of double charges. Express companies, either through carelessness or design, often neglect to mark their paid packages, and thus, without the receipt to confront them, they mulct their customers at each end of the route. Look out for them.

Patent Laws and Guide to Inventors.—This pamphlet contains not only the laws but all information touching the rules and regulations of the Patent Office Price 12 1-2 cents per copy. A Circular, giving instructions to inventors in regard to the size and proper construction of their models with other useful information to an applicant for a patent, is furnished gratis a this office upon application by mail.

Receipts—When money is paid at the office for subscription, a receipt for it will always be given; but when subscribers remit their money by mail, they may consider the arrival of the first paper a bona fide acknowledgment of the receipt of their funds.

Patent Claims—Persons desiring the claim of any invention which has been patented within fourteen years can obtain a copy by addressing a letter to this office stating the name of the patentee, and date of patent when known, and enclosing $1 as fees for copying.

Give Intelligible Directions—We often receive letters with money enclosed, requesting the paper sent for the amount of the enclosure but no name of State given, and often with the name of the post office also omitted. Persons should be careful to write their names plainly when they address publishers, and to name the post office at which they wish to receive their paper, and the State in which the post office is located.

### Literary Notices.

Irving's Life of Washington.—Messrs. G. P. Putnam & Co., 321 Broadway, have now published three editions of this great national work,—a library edition, octavo, for $2 per volume; a popular 13mo. edition, $1 50 per volume, and an illustrated edition, which is now issuing in semi-monthly parts at 25 cts. per number. This last edition will form one of the most magnificently illustrated works ever published. The engravings have an historical value, from the fact that the portraits are bona fide portraits and historical pieces, true so far as the topography of the countries and the likenesses of the individuals represented are concerned. Every American mechanic should put this work in one form or the other, on his book-shelf, side by side with his Bible. Let your children read it, and learn by the example of the great Washington, the lessons of patriotism, moral courage, perseverance under difficulties, which the history of his life so especially affords. We know of no American book which we had rather own than this; it is worth a thousand of the trashy publications which the press is daily sending forth. Messrs. G. P. Putnam & Co. will send their volumes complete, free of postage, on receipt of the prices above named.

Blackwood's Magazine.—"Old Ebony" is a good number for this month. The story of "The Athelings" is continued; "Mayside Songs" are a rich literary treat; "Family History" is a review of a work on the persecuted family of Baillie, of Jerviswood; 'African Travel," is a review of Burton's Travels in East Africa. All the articles are well written, and in that sparkling style for which Blackwood is famous. Published by Leonard Scott & Co., Gold street, this city.

The Game of Billiards—This is the title of a work on this game, by Michael Phelan, of this city, the distinguished player and inventor of the patent Billiard Tables and Cushions illustrated on page 116, Vol 11, Sci. Am. The book contains a history of the game, explains its scientific principles, gives full instructions how to play, also the laws which regulate the game. It is written in a clear and lively style, showing Mr. Phelan can write with the same skill he invents and plays. It is illustrated with numerous wood cuts: and, we are informed, that since the publication referred to above, his tables have found a favorable introduction into use. Published by D. Appleton & Co., this city.

### Terms of Advertising.

Twenty-five cents a line each insertion. We respectfully request that our patrons will make their advertisements as short as possible. Engravings cannot be admitted into the advertising columns.

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Private consultations respecting the patentability of inventions are held free of charge, with inventors, at our office, from 9 A. M., until 4 P. M. Parties residing at a distance are informed that it is generally unnecessary for them to incur the expense of attending in person, as all the steps necessary to secure a patent can be arranged by letter. A rough sketch and description of the improvement should be first forwarded, which we will examine and give an opinion as to patentability, without charge. Models and fees can be sent with safety from any part of the country by express. In this respect New York is more accessible than any other city in our country.

Circulars of information will be sent free of postage to any one wishing to learn the preliminary steps towards making an application.

In addition to the advantages which the long experience and great success of our firm in obtaining patents present to inventors, they are informed that all inventions patented through our establishment, are noticed, *at the proper time*, in the Scientific American. This paper is read by not less than 100,000 persons every week, and enjoys a very wide spread and substantial influence.

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**COTTON AND FLAX SEED OIL.**—WILLIAM C WILBER has just put into successful operation his newly patented Machinery for Hulling Cotton Seed, and the steam process in extracting oils from oleaginous seeds. The press is upon an entirely new principle, making a great saving in labor and materials. For information respecting the use of the patents or purchase of State rights, apply to the General Agent for the United States and Europe, CHARLES VAN WYCK,
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**TAKE NOTICE**—All persons having secured space and those wishing to secure admittance for their patented inventions and valuable works of art, in the halls of free exhibition connected with the New York Arcade, are requested to deposit their goods without delay, in time for classification before the grand opening in December. To avoid delay, and for the benefit of those in distant States. Terms of admittance for all articles occupying a space 1 foot in length 1, 2, or 3 wide, or less, $10 per year; every additional foot long or wide, $5 per year,—or for 3 or six months at the same rate. All moneys, or goods, and communications must be addressed to R. D. GOODWIN, Superintendent of the New York Arcade. 594 Broadway. N. B. All further information freely given by pre-paying letters. 1*

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**NORCROSS ROTARY PLANING MACHINE.**—The Supreme Court of the U. S., at the Term of 1853 and 1854, having decided that the patent granted to Nicholas G. Norcross, of date Feb. 12, 1850, for a Rotary Planing Machine for Planing Boards and Planks is not an infringement of the Woodworth Patent.
Rights to use the N. G. Norcross's patented machine can be purchased on application to N. G. NORCROSS.
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# Science and Art.

### The Use of Salt in Food.

Dr. Chambers, of London, in his recently published work on Digestion and its Derangements, says of common salt in food :—

"The employment of salt in the average healthy state, is decidedly beneficial to the human species, and the use of it as an accessory aliment is wise in those who are well supplied with other food.

The physological actions of salt indeed lead us to expect that it must be hurtful in some cases. Where waste is already excessive, or under circumstances where the diet is insufficient, the advantage of salt is a matter of serious doubt. Where food is deficient in quantity or quality, it is evidently improper that any excess of salt should be used beyond that which is just sufficient to act as a complementary aliment; all beyond this increases the waste. Encouragement should be given to employ instead, other spicy flavorings which have not this tendency, or which have even a contrary tendency,.

It is to be remarked that the question of the use of salt as an accessory food is by no means the same as that of the employment of salted provisions. The manufacturing process so dries up and hardens the muscular fiber that without diligent cookery it is insoluble in the gastric juice, and in point of fact is an insufficient nutriment, a state of things where it has been said salt is improper. When salted provisions must be used, the desideratum is a mode of cookery which would render the albumen and fibrine again soluble."

### Sewerage Manure

Mr. Mechi, the celebrated English cultivator, directs attention, through the columns of the London *Times*, to the importance of using the sewerage matters of the city of London for fertilizing land. He believes that if the sewerage of that great city was saved and applied to agriculture it would fertilize thousands of acres of land, which are now almost barren wastes in England. We believe he is right, and the same might also be truly said of the sewerage of New York. In this great city, having half a million of inhabitants, as much fertilizing materials flow through the sewers every year into the sea as would render the sand wastes of Long Island and New Jersey as fruitful as a well cultivated garden. It is high time that some attention was devoted to this question—the saving of sewerage for agricultural purposes.

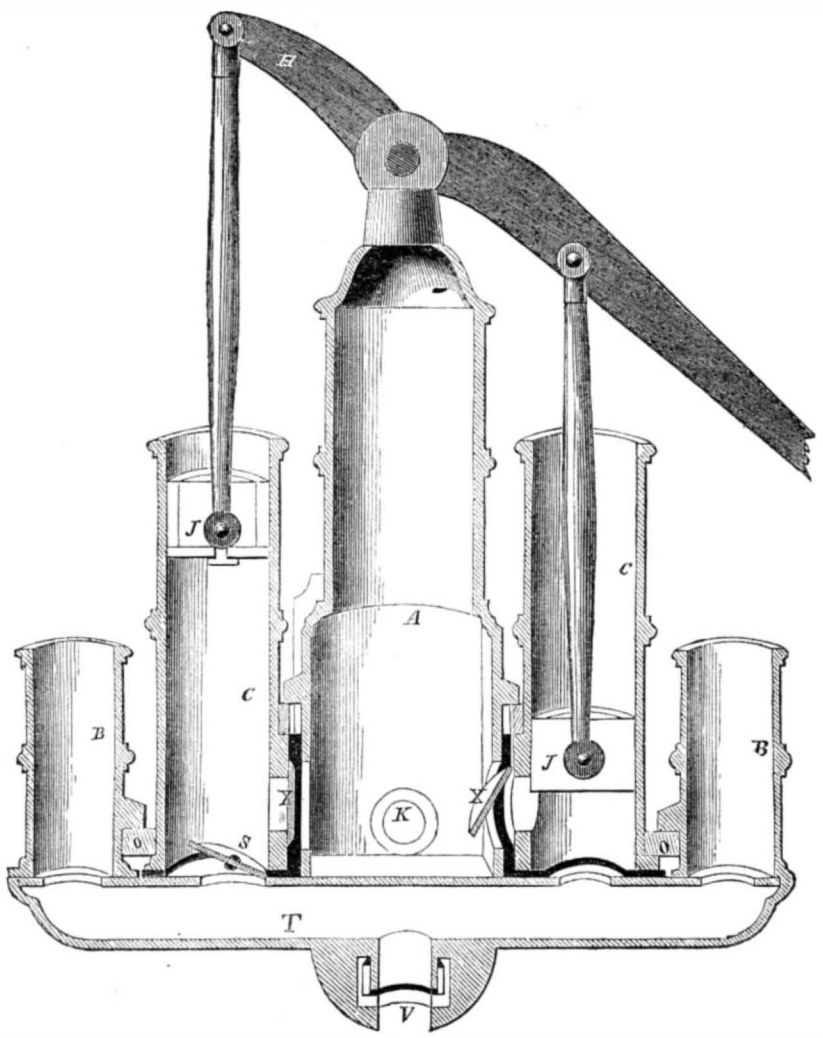
### Air Vessels on Pumps.

The accompanying engraving is a vertical section of the application of air chambers on the supply or suction pipes of pumps—such as fire engines and single and double forcing pumps, the patent for which was granted to Benj. T. Babbitt, S. C. Higbee, and P. W. Plantz, on the 7th of October, 1842, but which has never been thus made known to the public before. As their patent was extended for seven years from the 7th of October last, and as but few are aware of the existence of such a patent, it will be of interest to a great number of persons, as air chambers on force pumps have become quite common, and many manufacturers are no doubt innocently infringing this patent.

A is the discharging air chamber ; K the discharge pipe ; B B are two air chambers set on the suction or supply pipe, T. The hose is screwed or hooked to the pipe, V. C C are the working cylinders ; J J are the plungers on them ; S S are the valves opening inwards from the supply pipe, T, into the working cylinders ; and X X are the valves opening from the cylinders into the discharge chamber, A. The pump chamber, A, and the bed plate having the inlet chamber pipe, T, are cast in one piece, and the cylinders and chambers are cast with wedge projections, leaving spaces between them, which, by keys or gibs, O O, connect them all together in a very simple manner ; H is the working lever. One air vessel, B, is placed on the supply pipe, for one cylinder, C, or only one air vessel may be situated on the supply pipe, as the case may require. The object of the air chambers so situated is for the purpose of giving elasticity to the re-action of the water in the supply pipe, so as not to check, too suddenly, the velocity of the water while the pump is operating, and on the dead centers ; they cause less violent re-action in the supply pipes, and tend to produce a more steady stream from the pump and through the cylinders.

It is well known that pumps and fire engines, without suction air chambers, do not throw so steady a stream when worked quick, because the cylinders do not fill so rapidly. The air in the chambers, B, being elastic—capable of compression—while the water being incompressible, these chambers act the part of equalizers or regulators to the water. On page 144, Vol. 8, Scientific American, there is an illustrated article on the subject of *air vessels on the supply pipes of pumps*, de-

## AIR VESSELS ON THE SUCTION OF PUMPS.




tailing experiments which had been made with and without such vessels. A very large increase of duty was obtained by the use of these air chambers. The usefulness of air chambers connected with the supply pipes of pumps is now generally admitted, but as we stated before, few are aware of the existence of this extended patent relating to them.

The following is the claim of the patentees: —"The application of the air chambers, B B, to the supply pipes or engines, together with the manner in which the pump is cast, as shown and described."

More information may be obtained from Benj. T. Babbitt, agent, now residing at Nos. 68 and 70 Washington street, this city, but who was a resident of Little Falls, N. Y., when the patent was originally granted.

### Atmosphere for Consumptive Persons.

A writer in the *British and Foreign Medico-Chirugical Review*, who has made upwards of three thousand observations upon respiration in consumption, says that the sitting and studying position in that disease call for more expenditure of power, and tend to produce more subsequent exhaustion than in health, and that the lying posture saves the strength. The effect upon respiration is much less than the standing posture. Hence the latter practice tends further to exhaust the system by increasing the blood motion. High temperature, with the accompaniment of dry air, also tends to rapid exhaustion by greatly increasing the blood motion, and greatly lessening the introduction of air; and, on the contrary, low temperature and moisture increase verification of the blood and lessen the rapidity of the blood current. Hence, in consumption, a moderately cool and moist air is the most conductive, he says, to health, and the hot summer season induces exhaustion.

Many persons, and among the number eminent physicians, have inculcated the idea that a moderately cool and moist atmosphere was injurious to consumptive persons, and that a dry, warm or cool atmosphere was the most favorable for them. Upon this very theory it has been customary to send consumptive persons from cold and moist climates to warm or cold dry climates. "How doctors do differ."

From cases which have come under our own observation we are of opinion that damp climates are generally injurious to persons predisposed to consumption, while dry climates are beneficial. Many consumptive persons have gone from the sea-board of the Atlantic States to the dry, cold regions of the north-west, and have entirely recovered, and such has also been the case with others who have gone to Florida. These results we attribute to the dry atmosphere of those regions.

### Something New About Ozone.

Andrews has communicated the results of a very elaborate and extended investigation on this subject, which forms an important contribution to our knowledge. The author in the first place repeated the experiments of Baumert, who arrived at the conclusion that ozone is the peroxyd of hydrogen, having the formula $HO^3$. Andrews found that no two experiments led to the same constitution for this peroxyd, and finally discovered that the discrepancy was owing to a small quantity of carbonic acid which, without great care, is always mixed with electrolytic ozone. In Baumert's experiments the increase of weight of the apparatus was always greater than the weight of the ozone as deduced from its chemical action. Andrews found, however, that when the carbonic acid was completely removed these two qualities exactly agreed, so that it is proved that water is not a product of the decomposition of the ozone, and therefore that this contains no hydrogen. In like manner it was shown that no water is produced when ozone is decomposed by heat. The ozone obtained by electrolysis by the action of the electric spark and by the oxydation of phosphorus was found to be identical. Finally, it was found that ozone contained no nitrogen. The author concludes from his investigation that ozone is oxygen in an allotropic modification, and not a compound body as supposed by Schonbein, Williamson, and Baumert.—*Silliman's Journal.*

### A South Sea Dredger.

The people of the port of Honolulu, have obtained a dredging machine, to deepen the channel, but it seems to be a baulky sort of an animal. It has been tried again and again, but has always broken down. Our exchange, the Honolulu *Advertiser*, says:—

It was announced last Saturday with considerable flourish that this *machine* which is now getting to be quite renowned, was going to work on Monday to deepen the channel. So on Monday all eyes were turned toward the entrance of the harbor to see how the work progressed. Up to yesterday three entire bucketsfull had been scooped up, but from some cause the dredge has returned to the harbor, and now lies 'in ordinary,' alongside the wharf where she was built. We remember an old saw which runs thus, and is quite appropriate :

"Jack and Gill went up the hill," &c.

Those having charge are specially requested to report progress, and give public information when the channel is deepened."

### An American Knighted.

Late news from Europe bring the intelligence that Prof. Morse has been knighted by the King of Denmark—the order of Danneborg being conferred upon him as a token of admiration for his invention of the Electro-Magnet Telegraph.

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